EDUCATIONAL MANAGEMENT STRATEGIES TO IMPROVE THE STUDENTS' SUSTAINABLE LEARNING ABILITY IN HIGHER VOCATIONAL COLLEGES IN GUANGDONG PROVINCE

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Thesis Title Educational Management Strategies to Improve the Students' Sustainable Learning Ability in Higher Vocational Colleges in Guangdong Province

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ABSTRACT

The objectives of this research were: (1) to examine the current and expected situations of students' sustainable learning ability in Higher Vocational Colleges in Gangdong Province, (2) to develop educational management strategies to improve students' sustainable learning ability, and (3) To evaluate the adaptability and feasibility of these educational management strategies. Utilizing a mixed-methods approach, the study sampled 384 students from top higher vocational colleges using the Krejcie and Morgan table and multi-stage random sampling. Data collection included questionnaires, expert interviews, focus group discussions, and strategy evaluations. The primary instrument used in data collection was a 5-level rating scale questionnaire, which assessed both current and expected situations. The questionnaire obtained an IOC index between 0.60 and 1.00, a discrimination power index between 0.42 and 0.89, and a reliability index of 0.88. The statistical methods used for data analysis included percentage, mean, standard deviation, $PNI_{Modified}$, and content analysis.

Findings highlighted three key components influencing sustainable learning: school environment, teacher factors, and student factors. The results were as follows: (1) The current situation was rated as high (M=3.69), with the school environment scoring the highest (M=3.77). Conversely, the expected situation was rated very high (M=4.52), revealing significant gaps in student factors ($PNI_{Modified}$=0.24) and teacher factors ($PNI_{Modified}$=0.23), which were identified as critical areas for development. (2) The educational management strategies to improve students' sustainable learning ability comprised a vision, five missions, five goals, five strategies, 25 operational approaches, and 25 indicators. (3) Expert evaluations indicated that the strategies had extremely high adaptability (M=4.58), and feasibility (M=4.61), underscoring their practical applicability.

Keywords: Educational management Strategies, Students' sustainable learning ability, Higher vocational colleges

ชื่อเรื่อง	**กลยุทธ์การจัดการการศึกษาเพื่อเสริมสร้างความสามารถในการเรียนรู้ที่ยั่งยืนของนักศึกษาในวิทยาลัยอาชีวศึกษาระดับสูงในมณฑลกวางตุ้ง**
ชื่อผู้วิจัย	**ได๋ ไป่หยาง**
สาขาวิชา	**การจัดการศึกษาเพื่อการพัฒนาที่ยั่งยืน**
อาจารย์ที่ปรึกษาหลัก	**รองศาสตราจารย์ ดร.ธัชกร สุวรรณจรัส**
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ปีการศึกษา	**2024**

บทคัดย่อ

วัตถุประสงค์ของการวิจัยนี้ ได้แก่ (1) วิเคราะห์สถานการณ์ปัจจุบันและสถานการณ์ที่คาดหวังของความสามารถในการเรียนรู้แบบยั่งยืนของนักศึกษาในวิทยาลัยอาชีวศึกษาระดับสูงในมณฑลกวางตุ้ง (2) พัฒนากลยุทธ์การจัดการศึกษาเพื่อเสริมสร้างความสามารถในการเรียนรู้แบบยั่งยืนของนักศึกษา และ (3) เพื่อประเมินความเหมาะสมและความเป็นไปได้ของกลยุทธ์การจัดการศึกษาดังกล่าว การศึกษานี้ใช้ระเบียบวิธีวิจัยแบบผสมผสาน (Mixed-Methods Approach) โดยสุ่มตัวอย่างนักศึกษาจำนวน 384 คน จากวิทยาลัยอาชีวศึกษาระดับสูงชั้นนำ โดยใช้ตารางของ Krejcie และ Morgan และวิธีการสุ่มแบบหลายขั้นตอน การเก็บรวบรวมข้อมูลประกอบด้วยแบบสอบถาม การสัมภาษณ์ผู้เชี่ยวชาญ การสนทนากลุ่ม และการประเมินกลยุทธ์ เครื่องมือหลักที่ใช้ในการเก็บข้อมูลคือ แบบสอบถามมาตราส่วน 5 ระดับ ซึ่งใช้ในการประเมินทั้งสถานการณ์ปัจจุบันและสถานการณ์ที่คาดหวัง แบบสอบถามนี้มีค่าดัชนีความตรงเชิงเนื้อหาระหว่าง 0.60 – 1.00 ค่าอำนาจจำแนกระหว่าง 0.42 – 0.89 และค่าความเชื่อมั่นที่ 0.88 สถิติที่ใช้ในการวิเคราะห์ข้อมูล ได้แก่ ร้อยละ ค่าเฉลี่ย ส่วนเบี่ยงเบนมาตรฐาน $PNI_{Modified}$ และการวิเคราะห์เนื้อหา

ผลการวิจัยชี้ให้เห็นถึงองค์ประกอบสำคัญ 3 ประการที่มีผลต่อความสามารถในการเรียนรู้แบบยั่งยืน ได้แก่ ปัจจัยด้านสภาพแวดล้อมของโรงเรียน ปัจจัยด้านครู และปัจจัยด้านนักศึกษา โดยมีผลลัพธ์ดังนี้ (1) สถานการณ์ปัจจุบันอยู่ในระดับสูง (M=3.69) โดยปัจจัยด้านสภาพแวดล้อมของโรงเรียนมีค่าเฉลี่ยระดับมาก (M=3.77) ในทางตรงกันข้าม สถานการณ์ที่คาดหวังมีค่าเฉลี่ยอยู่ในระดับมากที่สุด (M=4.52) โดยพบว่ามีช่องว่างที่สำคัญในปัจจัยด้านนักศึกษา ($PNI_{Modified}$=0.24) และปัจจัยด้านครู ($PNI_{Modified}$=0.23) ซึ่งเป็นประเด็นสำคัญที่ต้องได้รับการพัฒนา (2) กลยุทธ์การจัดการศึกษาเพื่อเสริมสร้างความสามารถในการเรียนรู้แบบยั่งยืนของนักศึกษา ประกอบด้วย วิสัยทัศน์ 5 พันธกิจ 5 วัตถุประสงค์ 5 กลยุทธ์ 25 แนวทางการดำเนินงาน และ 25 ตัวชี้วัด (3) การประเมินโดยผู้เชี่ยวชาญระบุว่ากลยุทธ์ดังกล่าวมีความเหมาะสมระดับมากที่สุด (M=4.58) และมีความเป็นไปได้ระดับมากที่สุด (M=4.61) ซึ่งสะท้อนถึงความเป็นไปได้ในการนำไปใช้จริง

คำสำคัญ กลยุทธ์การจัดการศึกษา, ความสามารถในการเรียนรู้อย่างยั่งยืนของนักศึกษา, วิทยาลัยอาชีวศึกษาชั้นสูง

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Dai BaiYang

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Chapter 1
Introduction

Rationale

The 21st century is characterized by rapid advancements and continuous change, emphasizing the need for "people as the center of development." China identifies human resources as the cornerstone of sustainable development, and learning has emerged as a critical necessity for individuals, organizations, and society (Xianghua, 2010). In this context, cultivating sustainable learning abilities and promoting sustainable development have become essential priorities within the education sector. Among these priorities, fostering students' sustainable learning and development abilities is a pivotal challenge in higher vocational education, particularly in Guangdong Province.

Schools remain central to the learning process, yet educational strategies in higher vocational institutions often fail to comprehensively develop students' abilities, qualities, and lifelong learning skills (Chen Xiaoyan, 2023). While contemporary education increasingly emphasizes the holistic development of talent encompassing ability, quality, and lifelong learning, the foundational element of sustainable learning ability is frequently overlooked. Learners' sustainable learning capacity primarily depends on acquired education and cultivation. Educators must encourage students to internalize learning as necessary for personal growth and societal contribution. This requires transforming classroom practices to foster innovative thinking, problem-solving skills, and the ability to explore and acquire knowledge independently (Shi, 2018).

Challenges in fostering sustainable learning abilities**.** Despite its importance, developing sustainable learning abilities among higher vocational students faces significant barriers. Students often exhibit low motivation, weak engagement, and limited autonomy in learning, which impedes their academic performance and long-term development (Zhang Rong & Deng Will, 2023). Additionally, the alignment of educational practices with global visions, such as UNESCO's emphasis on self-learning, practical abilities, and knowledge transfer, remains inadequate (Wang Zhencun & Zhang Qingyu, 2023). Sustainable learning demands the self-directed exploration of knowledge and the ability to apply acquired skills to solve real-world problems. However, vocational colleges often prioritize structured learning over fostering autonomy, leaving students ill-prepared to

meet the demands of a rapidly changing world (Shen Xinyue, 2024). The research underscores the critical role of self-directed learning in cultivating sustainable learning abilities. Autonomous learning, recognized as a core competency in the information age, encompasses the capacity to design and execute personalized study plans, engage in inquiry-based activities, and develop lifelong learning habits. However, higher vocational institutions frequently neglect these aspects, emphasizing compliance and rote learning (Lu Xiaolong & Wei Ai, 2015). This gap underscores the urgent need for educational management strategies that nurture students' ability to independently address problems, adapt to changes, and engage in continuous learning.

Global context and societal implications. The necessity for sustainable learning is magnified in the face of 21st-century societal and technological complexities. Barnett (2023) describes modern society as one of "uncertainty" and "super-complexity," where adaptability and lifelong learning are essential for both individual and societal resilience. This global landscape demands that educational systems equip students with the capacity to navigate evolving challenges and seize emerging opportunities. In this context, fostering sustainable learning abilities is critical for personal growth and ensuring societal competitiveness in a dynamic global economy (Qin Yuan et al., 2018).

Educational management strategies must, therefore, prioritize the development of sustainable learning capabilities. Approaches such as inquiry-based learning and student-centered pedagogy align with the international consensus on the importance of learning competencies as foundational to personal and societal advancement (Jin Ruwei et al., 2012). Cultivating these abilities ensures that students remain engaged as lifelong learners who contribute to societal development beyond formal education (He Huirong, 2023). By integrating these strategies, higher vocational colleges can better address local educational challenges while aligning with broader global trends in sustainable development.

Significance of the study. Given the rapid pace of societal and technological advancements, traditional knowledge acquisition is insufficient to meet future challenges. Sustainable learning encompasses continuously acquiring, analyzing, and applying new knowledge in response to evolving demands. This capability is a hallmark of lifelong learning and a prerequisite for individual and societal progress. In higher vocational education, students must be equipped to adapt to the unpredictable changes of the modern world. As Xu, Jialu, and Li (2023) highlight, fostering learning ability is integral to preparing individuals to thrive in an era of "super-complexity" and constant change.

In the context of Guangdong Province, the lack of comprehensive strategies tailored to the unique needs of higher vocational colleges further exacerbates these challenges. Students in these institutions often struggle to maintain engagement and motivation, which hinders their capacity for sustainable learning. Addressing these issues requires a paradigm shift in educational management, emphasizing student autonomy, inquiry-based learning, and cultivating lifelong learning habits (Zhao Weiwei & Suo Fang, 2014). Such an approach aligns with the vision of contemporary higher education, which seeks to produce skilled professionals and adaptive, independent learners who can navigate the complexities of a rapidly changing world (Nana Mao et al., 2020).

Conclusion

The challenges and opportunities associated with fostering sustainable learning abilities in higher vocational education underscore the critical need for this study. This research aims to bridge the gap in cultivating students' sustainable learning capabilities by identifying and implementing effective educational management strategies. Such efforts are essential for addressing local educational challenges in Guangdong Province while contributing to global efforts to promote lifelong learning and sustainable development. Ultimately, empowering students with sustainable learning abilities ensures their success in an evolving global economy and strengthens the resilience and competitiveness of society as a whole.

Research Questions

1. What are the current and expected situations of students' sustainable learning ability in higher vocational colleges in Guangdong Province?

2. What are the educational management strategies to improve the students' sustainable learning ability in higher vocational colleges in Guangdong Province?

3. Are the educational management strategies to improve students' sustainable learning ability in higher vocational colleges in Guangdong Province adaptable and feasible?

Research Objectives

1. To examine the current and expected situation of students' sustainable learning ability in higher vocational colleges in Guangdong Province.

2. To develop educational management strategies to improve the students' sustainable learning ability in higher vocational colleges in Guangdong Province.

3. To evaluate the adaptability and feasibility of educational management strategies to improve the students' sustainable learning ability in higher vocational colleges in Guangdong Province.

Scope of the Research

Population and the Sample Group

Population

Guangdong Province has 93 higher vocational colleges with 1.254 million students and about 50,000 educational administrators and teachers. This study will select teachers and students from four representative higher vocational colleges based on regional conditions as the research subjects, namely 33,475 students in the Pearl River Delta (PRD), 9,786 students in Eastern Guangdong (EGD), 17,599 students in Western Guangdong (WGD) and 17,664 students in Northern Guangdong (NGD). The informants are the best schools among the higher vocational colleges in PRD, EGD, WGD, and NGD: Shenzhen Vocational and Technical College, Shanwei Vocational and Technical College, Maoming Vocational and Technical College, and Heyuan Vocational and Technical College.

The Sample Group

A. Collecting the sample of the questionnaire

According to the sampling table of Krejcie R.V. and Morgan D.W. (1970), the sample group of this study will adopt the purpose sampling method and select the best schools from the higher vocational colleges in the four regions of PRD, EGD, WGD, and NGD for questionnaire survey. A total of 384 students were sampled, which is more representative of students' sustainable learning ability. To ensure the representativeness of the sample group, this study will strive to ensure that the sample group reflects the characteristics of the entire population in terms of gender, age, grade, etc. In selecting the sample group, this study will follow scientific sampling principles such as randomness and representativeness to ensure the validity and credibility of the research results. At the same time, this study will respect each participant's rights and privacy to ensure the research's ethics.

B. In-depth Interviews

In this study, eight people from four higher education institutions were selected. The full-time teachers and teaching administrators had to fulfill the following requirements: 1) they had worked in the school for more than five years; 2) they were familiar with the specifics of the school's development plan, teaching management, and student development, 3) must be willing to participate in the recorded structured interviews, and 4) must be willing to review their interview transcripts for validation.

C. Strategies Developed with Samples as Focus Groups

The target group for developing strategies to improve students' sustainable learning in higher education institutions consisted of twelve participants: four full-time teachers and four instructional administrators from four higher education institutions. The selection criteria for the full-time teachers and instructional administrators were as follows:

They had worked at their respective institutions for more than five years.
They were familiar with their institution's development plan, teaching management, and student development.

Additionally, four experts from higher education institutions were included. These experts were selected based on their significant influence on strategy formulation, sustainable development, students' learning abilities, talent cultivation, and education management in higher vocational institutions. The selection criteria for the experts included:

1. At least 5 years of professional experience.
2. Possession of senior professional titles.
3. Roles as senior leaders within their respective institutions.

D. Target group of strategy evaluation

The five experts for evaluation of the integration strategy of production and education are from Shenzhen Institute of Vocational Technology and Heyuan Institute of Vocational Technology, who greatly influence strategy formulation, sustainable development, students' learning ability, talent cultivation, and education management of higher vocational institutions. The experts’ qualifications: 1) more than 15 years of work, 2) senior titles, and 3) senior leaders.

The Variable

Independent Variable

Countermeasures to enhance the sustainable development of students' learning ability in higher education institutions. According to the analysis of related theories and research, the students' sustainable learning ability in higher vocational colleges are as follows:

Current and expected situation of students' sustainable learning ability include:

1. school environment factors
2. teacher factors
3. student factors.

Dependent Variable

Educational management strategies to improve the students' sustainable learning ability in higher vocational colleges

Content (s)

1. to examine the current and expected situation of students' learning ability in higher vocational colleges and promote the sustainable development of students' learning ability in higher vocational colleges.

2. To enhance the formulation of strategies and concepts for the sustainable development of students' sustainable learning ability in higher vocational colleges and universities and verify the suitability and feasibility of the strategies.

Time

The study was conducted mainly from February 2024 to January 2025 with the following key phases:

1. In March 2024, the writing and review of the first three chapters were completed and successfully defended.

2. From May to October 2024, through the questionnaire survey and literature research, to understand the current situation of Higher Education Administration, sustainable learning ability, professional curriculum, and talent training programs in domestic and foreign higher education institutions and to analyze the current problems and reasons affecting sustainable learning ability.

3. November to December 2024: Research and formulate strategies to enhance the sustainable learning ability of students in higher vocational colleges and universities and invite experts to evaluate the adaptability and feasibility of these strategies.

4. Summarize the research results, complete the paper, and publish the paper in January 2025.

Advantages

The findings from this research on "Educational Management Strategies to Improve the Students' Sustainable Learning Ability in Higher Vocational Colleges in Guangdong Province" are expected to benefit various stakeholders in the education sector. Specifically:

1. Higher Vocational Colleges: The research provides valuable insights into effective educational management strategies that can be implemented to enhance students' sustainable learning abilities. College administrators and faculty can apply these strategies to improve teaching methods, curriculum design, and student engagement, ultimately leading to better learning outcomes and academic success.

2. Government Education Authorities: Policymakers at the provincial and national levels can use the research findings to inform the development of policies to strengthen vocational education. The study may help shape future regulations and initiatives that promote sustainable learning practices across vocational institutions.

3. Educational Researchers: Scholars and researchers can use the results as a foundation for further studies on sustainable learning in vocational education. This research may inspire additional investigations into how educational management strategies can contribute to long-term learning sustainability.

4. Students: By implementing the strategies identified in the study, students can benefit from an improved learning environment that fosters critical thinking, adaptability, and lifelong learning, all essential for career development and success in the labor market.

5. Industry Stakeholders: Employers and industry leaders can benefit from a better-prepared workforce. Students who develop sustainable learning abilities will be more adaptable, innovative, and capable of responding to changing industry needs.

In summary, this study’s results are expected to have a broad impact, benefiting educational institutions, policymakers, students, and industry leaders by enhancing the overall quality of vocational education in Guangdong Province.

Definition of Terms

Higher Education Administration 0refers to managing an educational system that combines human and physical resources to oversee, plan, strategize, and implement structures that enforce the educational system.

Sustainable Learning ability: The ability of a person to master effective cognitive strategies based on a certain level of cultural knowledge and to learn continuously and autonomously.

Higher Vocational Institutions refers to Higher Vocational Institutions (HVIs) are short for colleges of higher vocational education, which provide higher education services. The academic system of higher vocational colleges usually lasts three years, with full-time specialized level higher vocational education as the main content. Higher vocational colleges and universities mainly provide higher vocational education at the specialist level. Through full-time, three-year study, they aim to cultivate high-level technical and applied specialists with the necessary theoretical knowledge, strong practical ability, comprehensive quality, and business ability.

Educational management strategy refers to a strategy can also be used as a course of action and methodology developed according to the situation's development. Educational management strategy refers to the collection of programs adopted to achieve the organizational goals of educational management when carrying out management activities in the field of education.

Strategy evaluation refers to the assessment of the adaptability and feasibility scores of the educational management strategies to improve students' sustainable learning ability in higher vocational colleges in Guangdong Province. These scores are compared against set criteria to determine whether each strategy and its components fall into the categories of very high, high, moderate, low, or very low.

Current situation refers to the actual state or existing conditions of students' sustainable learning ability in higher vocational colleges in Guangdong Province.

Expected situation refers to the desired or anticipated state of students' sustainable learning ability in higher vocational colleges in Guangdong Province, based on educational goals, standards, and development expectations.

Current and expected situation of students' sustainable learning ability consists of

1. school environment factors
2. teacher factors
3. student factors.

SWOT Analysis refers to a strategic planning tool used to evaluate the internal strengths (Strengths) systematically, weaknesses (Weaknesses), and external opportunities (Opportunities) and threats (Threats) of an organization, project, or individual. By analyzing these four dimensions, SWOT analysis helps decision-makers fully understand the current situation and provide a basis for formulating strategies.

TOWS matrix refer to an extension tool of SWOT analysis. It is used to systematically match internal strengths (Strengths) and weaknesses (Weaknesses) with external opportunities (Opportunities) and threats (Threats) to generate specific strategic options. The TOWS matrix helps organizations develop more targeted and actionable strategies by cross-analyzing internal and external factors.

Research Framework

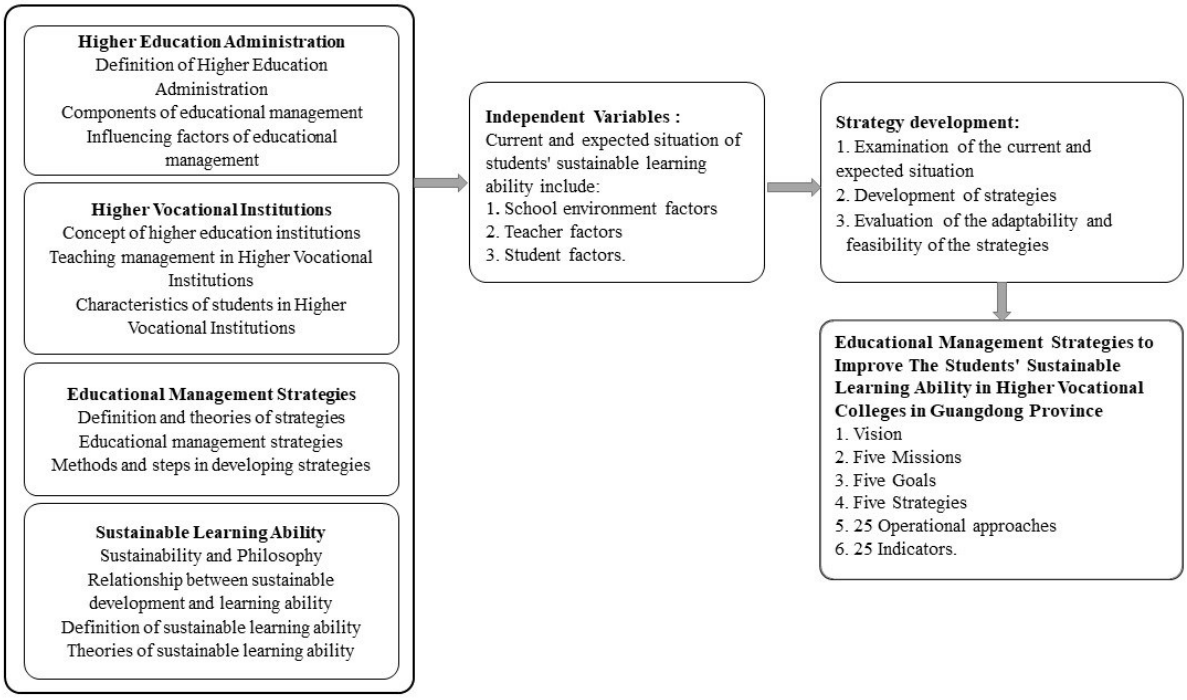

Figure 1.1 Research Framework

Chapter 2
Literature Review

This study refers to the theories and research results of relevant scholars at home and abroad in the areas of Higher Education Administration, sustainable learning ability, theories and concepts related to higher education institutions, and educational management strategies, and combs them in detail. On this basis, the researcher analyzes the literature and related research results from the following aspects:

1. Higher Education Administration
2. Sustainable Learning Ability
3. Higher education institutions
4. Educational management strategies
5. Related Research

Details are as follows:

Higher Education Administration

Definition of Higher Education

Higher Education (Higher Education) refers to the education implemented on the basis of the completion of higher secondary education, which is to cultivate high-level specialists with a sense of social responsibility, a spirit of innovation, and practical ability. Higher education is one of the major interrelated components of the education system. It usually includes all kinds of educational institutions whose main tasks and activities are high-level learning and training, teaching, research, and social service.

UNESCO has defined the concept of "higher education" many times, and the Conference on Higher Education held in Africa in 1962 with the participation of 44 countries (Qu Tao et al., 2018), "Higher education refers to the various types of education provided by universities, colleges of arts and letters, polytechnic institutes and teacher training colleges. all types of education provided by institutions such as universities, colleges of arts, polytechnics and teacher training colleges, where the basic entry requirement is the completion of secondary education, the general age of entry is 18 years, and degrees, diplomas or certificates are awarded on completion of the program as proof of completion of higher education".The 2011 revision of ISCED (Lai, 2012) states that, "Tertiary education

is built on secondary education and provides learning activities in specialized educational subject areas. It aims at highly complex and specialized learning. Higher education encompasses what is commonly understood as academic education, but is broader than academic education because it also includes advanced vocational or professional education. The Dictionary of Modern Chinese (Dictionary Editorial Office, Institute of Languages, Chinese Academy of Social Sciences, 2016) defines higher education in this way: 'Education that fosters talents with specialized knowledge and skills on the basis of secondary education.' Schools that implement higher education include universities and specialized colleges." Article 2, paragraph 2 of the Law of the People's Republic of China on Higher Education (Law of the People's Republic of China on Higher Education, 1999), which came into force in 1999, states, "Higher education as referred to in this law refers to education implemented on the basis of the completion of higher secondary education."

Domestic definitions of higher education are mainly as follows: (1) it is pointed out that higher education can be divided in terms of degree, professional nature, form of implementation, implementation institutions, etc.; (2) higher education is the education implemented after the stage of secondary education to cultivate people with specialized knowledge and skills or academic research talents, such as universities and colleges of specialization. In addition, Pan Maoyuan (1988) defines higher education as, "Higher education is a professional education built on top of general education, aiming at cultivating specialists, and the general age of full-time undergraduates is young people around 20 years old." It can be seen that the definition and division of higher education in the basic level, basic form, and professional division of labor are the same, in addition to this, higher education and social politics, economy, culture, and many other fields have a close relationship with a strong national cultural characteristics.

To sum up, in our country, higher education takes the end of secondary education as the starting point and carries out various forms of academic and professional education in the following stages, there are two types of full-time and amateur higher education; in the work of colleges and universities, talent cultivation is the center of its task, scientific and technological innovation is its basic task, and service to the society is the pursuit of its invariable.

Definition of Education Management

Educational management as an educational phenomenon for a long time, but as a unique field of academic research and practical activities since the mid-20th century. There are various definitions of the concept of "educational management".

Yang Yingxiu (2012), in her book School Management, emphasizes that school management should be described as the management of school education. Educational management involves not only the management of materials and equipment but also the management of educational programs and educational activities.

Wu Zhihong (2006) in his book "Educational Management" suggests that educational management is a specific field of social management. Realizing the functions of educational management requires taking into account those functions that are most general and common to all fields of social management. Educational management, in turn, has as its goal and destination of its activities the training of people of certain specifications. The objects of management are different, as well as the tasks and means and the nature of the processes and laws defined by the science of education, thus again differentiating it from other fields of social management.

Thomas J. Sergiovanni et al. (2011) in their book "Educational Management" consider educational management as management science plus education. According to him, management is putting rational understanding into organized activities. In modern industrialized societies, organizations and their management are highly permeable. So management is a large category of universal activities that vary in some aspects such as business, public relations, medicine, education, and other professions. Thus we can see management as a rational behavior of general principles as well as universal and particular components. Therefore, educational management refers to the process of utilizing management science and pedagogical theories to make the best use of various resources to achieve educational goals. It mainly focuses on the organization and operation process of education, including the design of educational plans, the guidance and monitoring of the educational process, the allocation of educational resources, and the assessment of educational quality.

Li Aixiong (2014) Educational management philosophy is the core of educational teaching management and the prerequisite for school development and innovation. Without advanced teaching philosophy, there is no original teaching management. A good principal, first of all, is a good educator, a teacher with a strong sense of innovation and innovative ideas. They should know the laws of education and teaching, be far-sighted,

have their unique understanding of education and teaching, have ambitious goals for the development of the school, and not be bound by tradition or follow the rules and customs.

Xu Nian's (2022) humanized concept of education management can promote the participation of educators and educated people in the management of higher education, to ensure that educators and educated people in the process of development, achieve academic freedom, freedom of scientific research, freedom of learning, freedom of teaching; help to strengthen the academic management of higher education in the process of development of the core of the academic and scientific research work, humanized management can achieve academic autonomy, and more to promote educators and educated people to actively participate in academic and scientific research, and so on. Educated people actively participate in academic and scientific research activities, to ensure that China's schooling strength and schooling level of enhanced for the transformation and optimization of China's higher education to lay the foundation for talent; to promote the development of high-quality talent, education management reform is not only the need for national development, but also the need for the development of talent, quality education advocates the cultivation of high-quality talent, to strengthen the diversified attention to the views and suggestions of talent, can truly build a harmonious society, to cultivate a group of diversified talents with an international perspective, and to develop a harmonious society. Cultivate a group of diversified talents with international vision, enhance the comprehensive strength of our country, and lay the talent foundation for national development and social progress.

Li Huayu (2023) The concept of student-oriented education management has become popular in the new century, providing important support for the education management of primary and secondary schools and ordinary colleges and universities. It has management advantages in 1. cultivating the autonomy of students' education management, 2. strengthening the diversified development of school education management, and 3. reducing the pressure on teachers' education management base.

Yu Hao (2023) With the rapid progress of science and technology, today's education concepts and models are constantly evolving and innovating. Chat GPT is a new type of artificial intelligence technology based on natural language processing, and the emergence of this technology also brings challenges and opportunities for education and teaching. The development of Chat GPT technology in the fields of education support, application scenarios, and education management has a positive impact on teachers' teaching and

students' learning. Chat GPT technology can not only help teachers to teach more effectively, improve their level, and improve the quality of teaching, but also cultivate students' learning ability and information processing abilities, and improve the efficiency of learning.

To sum up, education management is a comprehensive concept that covers all aspects of the education field, including the management of educational organizations, the allocation of resources, the guidance of the teaching process, and the control of educational quality.

Definition of Higher Education Administration

According to Xue Tianxiang (2001), Higher Education Administration refers to the process by which people consciously regulate various relationships and resources inside and outside the higher education system according to the purpose of higher education and the law of development to achieve the established purpose of the higher education system.

Wang Xuhui (2008) believes that comparing the characteristics and development trends of higher education quality assurance models in Western European countries, North American countries and Japan is of great significance in promoting the reform of China's higher education quality assurance system. To improve the operation effect of China's higher education quality assurance model and system, it is necessary to develop a diversified higher education quality assessment system, adopt scientific teaching quality assessment methods, and establish a perfect system for releasing higher education quality evaluation results.

Xiao Kai (2014) believes that with the deepening of international educational exchanges and cooperation, Chinese-foreign cooperative education mode is becoming more and more common, becoming an important part of China's education, higher and higher vocational colleges and universities to join the ranks of cooperative education, combined with the current situation of higher vocational colleges and universities in Chinese-foreign cooperative education student education management and new requirements, trying to explore the education management of higher vocational colleges and universities in Chinese-foreign cooperative education student education management. As a teacher, we try to explore the ways and methods to be a good "manager" and "servant" of students.

Wang Wei (2017) combined the actual status quo of China's higher education reform, specifically analyzed the relevance of the university concept and China's Higher Education

Administration system reform and practice strategy, that Higher Education Administration should focus on the role of institutional rights, make full use of institutional rights to achieve the optimal allocation and use of educational resources, and can promote the enhancement of the efficiency of education management.

Liu Tiejun (2019) believes that the internal governance of higher education is a system and process in which the subject of education uses public power and methods to ensure that the university performs its mission efficiently, accomplishes the established development plan, and promotes the sustainable development of the university, and it is a process of major adjustments in the internal power of the university and the rights and interests of various subjects of interest.

Officials (2019) believe that the unique governance model of Canadian universities provides a solid institutional guarantee for the level of internationalization of education, a clear internationalization strategy, a bottom-up internationalization path, and strong international institutions have laid a solid foundation for the internationalization of education. As a result, Chinese universities can draw inspiration from their internationalization experience and practices, and make positive efforts in the enhancement and strengthening of internationalization concepts, broad participation, team and institution building, etc., to promote the development of internationalization of higher education in China.

Yu Xiaobo and Huang Hao (2020) The starting point of Higher Education Administration is centered on talent cultivation, education is an activity to cultivate human beings, talent cultivation is the core task and work of education, and all activities of school education, including management activities, should be carried out closely around this center; the basic attribute of Higher Education Administration is academics-based, universities are responsible for the transmission and creation of profound learning, and safeguarding the academic right is the The protection of academic rights is the first and most basic problem facing the higher education system, and it is also the root of higher education problems.

To summarize, Higher Education Administration refers to the management of the education system, combining human and material resources to supervise, plan, formulate, and manage the education system.

And material resources in order to monitor, plan, strategize, and implement the structure for executing the education system. Higher Education Administration can improve

and enhance the quality of higher education in general and has a positive impact on the development and enhancement of the employability of university students.

Studies on the Evolution and Development of Higher Education

Research on the Historical Evolution of Higher Education In the study of higher education, the study of historical evolution is the focus of scholars' attention. Scholars mostly start from the historical staging to study the evolutionary characteristics and paths presented by higher education. At present, the research on the historical evolution of higher education since modern times mainly focuses on the dimensions of the Republican period, 17 years after the founding of New China, and after the reform and opening-up.

In the study of the development history of the transmutation of higher education in the Republic of China, scholars mostly locate their research vision on the overall overview of higher education or the change of a certain aspect. Zhu Qingbao (2014) and Yu Shi (2015) focus on the development and characteristics of higher education as a whole in the Republican period, and suggest that the changes and development of higher education in the Republican period have a lot of reference value for contemporary times, and focus on how to cooperate well among colleges and universities amidst the changing international climate and how to reduce the administrative color and enhance the academics in the current colleges and universities. Some scholars have shifted from an overview study of higher education in the Republican period to a study of the development of a specific aspect of higher education. Qu Tiehua and Wang Mei (2013) focus on the historical evolution of higher education in the Republican Period, pointing out that the development of higher education in the Republican Period is closely related to the political situation, and that the content of its policies has remained relatively stable and highly practical, and the whole policy system is amid continuous improvement and maturity changes. Qu Tiehua and Wang Mei (2015) further focus on the influencing factors of the transmutation process of higher education policies in the Republican period and draw their implications for contemporary times, including the need to promote the legalization of the construction of higher education policy system, to understand and make good use of higher education policies from the perspective of objectivity and rationality as well as instrumentality, to retain the good elements of the policies that are rooted in the traditional culture as well as to make good use of the international excellent cases and to enhance its practicality in the implementation stage of the policies. It is important to retain the good elements of policies rooted in traditional culture and to learn from the

best international cases, as well as to enhance the practicality of policies in the stage of implementation, to promote the development of higher education.

Usually, scholars divide the 17 years after the founding of New China as a historical stage and study it in economic, political, and cultural aspects. Hu (2000) focuses on this period, pointing out that during this period, China's higher education was affected by the political and current situation, and the center of work all centered on learning the Soviet Union's model of higher education, which was further divided into two stages with different degrees of learning, 1949-1956 and 1957-1965. Li Jun (2015), on the other hand, focuses on the transmutation process of higher education policy in the 65 years since the founding of New China, dividing it into six phases, including the foundation period.

Other scholars focus their research on the development of higher education policy after reform and opening up. Qi Zhanyong and Li Ying (2018) focus on the development of China's higher education policy in the past 40 years since the reform and opening up and divide the higher education policy changes into four stages, including the initial construction stage, the standardized development stage, the prosperous development stage, and the profound change. Yang Zunwei (2018) focuses on the reform of China's Higher Education Administration system since its reform and opening 40 years ago, pointing out that during the 40 years, China's Higher Education Administration system has roughly gone through four stages: restoration and adjustment, initiation, exploration and breakthrough, and deepening. For the stage division of the Higher Education Administration system since the founding of New China and the reform and opening up, scholars are mostly divided based on the key contents of the management system, presenting the results of the "three-stage" and "four-stage" divisions, although the division of the basis and perspective are different, but they are positive to the 21st century Higher Education Administration system. Although the basis and perspective of the division are different, all of them are actively contributing to the change of the management system of higher education in the 21st century.

In 2002, China's higher education development entered the massification stage, and the reform of higher education presented new characteristics, Ji Baocheng (2006), Li Liguo (2014), and other scholars focused on the hot issue of how to sustain the steady development of higher education in the massification stage. Xu Hong and Dong Zefang (2010) focus on the transmutation of the value orientation of higher education in the 60 years since the founding of New China from the perspective of education policy, which is the aspiration, position, and main direction of the policy at the time of its birth. Higher

education is linked to the fate of the country and is deeply influenced by the country's economic and political development, so for a long time after the founding of New China, the value orientation of higher education in China has been centered around the political center and the economic center of gravity. Subsequently, in the face of the new era, higher education pays more attention to the value and development of the individual and pays attention to the mutual correspondence between individual cultivation and social needs, therefore, the higher education policy in China in the later period presents the characteristics of the coexistence of personal value and social value based on knowledge orientation.

In 2018, the gross enrollment rate of higher education in China reached 48.1%, therefore, in recent years, some scholars have mostly started from the theoretical and practical level to carry out research related to the transition of higher education from the massification stage to the popularization stage. Bie Dunrong (2016) pointed out that the function of higher education in the popularization stage has historical continuity and development, and its personal and social functions are realized through a new structure and at the same time have new connotations, which should gradually deepen the reform of the institutional mechanism and establish the structure of the system in the popularization stage. Tang Hanqi (2016) focuses on university governance in the stage of popularization of higher education, pointing out that the popularization stage is the era of comprehensive governance of universities.

Development of educational management

The development of educational management has also gone through several stages, the most representative of which are the theories proposed by several scholars.

Stein (1865) proposed the early stage of educational management: early educational management mainly focused on organization and daily management. This stage mainly focuses on how to establish the organizational structure of the school, develop curriculum and teaching plans, and solve some common problems in the operation of the school (He Yanling, 2018).

Frederick Winslow Taylor (1911) proposed the stage of scientific management: at the beginning of the 20th century, the theory of scientific management developed rapidly in the industrial field and also began to be applied to educational management. This stage of educational management emphasized scientific and systematic management, focusing on planning, organizing, directing, and controlling. Educational administrators were called

upon to apply the scientific method to improve the efficiency of educational processes and institutions (Frederick Taylor, 2013).

Tingguang Luo (1942-1944) proposed the stage of administrative management: by the middle of the 20th century, traditional scientific management theories began to be replaced by administrative management theories. Administrative management theory focuses on the administrative roles and functions of educational administrators, emphasizing aspects such as how to manage people, budgets, and resources. Innovations in administration include decision-making theory, leadership theory, and human resource management (Tingguang Luo, 2008).

Peter Drucker (1954) proposed the systems/organizational management phase: in the 1960s, educational management theory was further developed into systems/organizational management theory. The theory considers school as a complex organizational system and emphasizes wholeness, systems thinking, and social interaction. This stage of educational management focuses on managing the goals, strategies, structure, and culture of the school (Peter Drucker, 2018).

Peter Sage (2009) proposed the stage of learning organization and leadership management: in the 21st century, learning organization theory and leadership management theory gradually become hot spots in the field of education management. Learning organization theory focuses on the learning ability and knowledge management of schools, focusing on learning, innovation, and adaptability within schools. Leadership management theory, on the other hand, focuses on the leadership and influence of educational administrators, emphasizing aspects such as vision, encouragement, and development of subordinates by educational administrators.

The goal of educational management is to improve the efficiency and quality of the educational system so as to better cultivate talents and promote social progress. And the development of educational management theories is an evolving process, in different times and contexts, various theories and ideas have emerged and influenced the practice of educational management. Different theories of educational management can complement and integrate each other, thus promoting the development and progress of educational management.

Components of Educational Management

Educational management consists of several key components that ensure the effective administration and development of educational institutions. Scholars have

identified various frameworks to define these components, emphasizing different aspects of educational administration.

Chi Jian (2014) categorizes educational management into five areas:

1. Plans and Goals: These serve as the foundation for strategic direction, guiding teaching and administrative activities. Effective planning includes both long-term strategies and short-term operational goals that adapt to changing environments.

2. Organization and Personnel: This focuses on structuring authority, distributing responsibilities, and managing human resources to optimize institutional performance.

3. Leadership and Decision-Making: Strong leadership influences motivation, innovation, and problem-solving, ensuring that decisions align with educational objectives.

4. Control and Evaluation

Institutions must continuously monitor and assess their operations to maintain quality, improve performance, and achieve desired outcomes.

5. Coordination and Communication

Effective communication facilitates collaboration within the institution and strengthens relationships with external stakeholders.

Hoy and Miskel (2012) propose a dynamic model of educational management, consisting of:

1. Planning: Establishing educational goals, strategizing, and allocating resources efficiently.

2. Organizing: Structuring personnel, resources, and responsibilities to enhance institutional efficiency.

3. Leading: Motivating, communicating, and guiding the educational team towards achieving institutional objectives.

4. Staffing: Selecting, training, and retaining high-quality educators to ensure effective teaching and learning.

5. Controlling: Implementing monitoring and evaluation mechanisms to assess educational effectiveness and make necessary adjustments.

6. Innovation and Change: Adapting to educational advancements and societal shifts to maintain relevance and competitiveness.

Wenrong Liu (2019) expands the scope of educational management by identifying nine essential aspects:

1. Organizational Management: Establishing institutional structures, systems, and cultures to support educational objectives.

2. Human Resource Management: Recruiting, training, evaluating, and retaining faculty and staff to maintain high educational standards.

3. Financial Management: Managing budgets, fundraising, resource allocation, and cost control to ensure financial sustainability.

4. Facilities Management: Overseeing campus infrastructure, maintenance, and equipment utilization to support learning environments.

5. Curriculum Management: Designing, implementing, and evaluating curricula to meet educational goals and student needs.

6. Student Affairs Management: Addressing student services, extracurricular activities, and welfare to foster holistic development.

7. Assessment and Feedback: Conducting regular evaluations to measure institutional performance and enhance teaching effectiveness.

8. Strategic Planning and Implementation: Developing long-term strategies, analyzing internal and external environments, and ensuring successful execution.

9. Educational Policy Research and Formulation: Studying and designing policies to align with educational trends and regulatory standards.

Yan Lixia (2023) focuses on higher education administration, highlighting nine components:

1. Academic Management: Overseeing curriculum design, academic standards, and teaching quality assurance.

2. Resource Management: Allocating human, financial, and material resources to optimize institutional efficiency.

3. Student Affairs Management: Providing comprehensive support services and extracurricular programs for student development.

4. Quality Management: Implementing mechanisms to assess and enhance the quality of education and student learning outcomes.

5. Policy and Regulatory Management: Ensuring compliance with national and international educational policies and regulations.

6. International Exchange and Cooperation: Facilitating global partnerships, student mobility programs, and academic collaborations.

7. Research Project Management: Planning, organizing, and evaluating research initiatives to advance academic knowledge.

8. Faculty Development and Management: Supporting teacher recruitment, training, evaluation, and professional growth.

9. IT Management: Utilizing technology to improve administrative processes, student information systems, and research databases.

Summary Educational management encompasses strategic planning, organizational structure, leadership, evaluation, resource allocation, and innovation. Scholars have identified different frameworks that emphasize various components, but all highlight the importance of effective administration, adaptability, and continuous improvement in ensuring the efficiency and quality of educational institutions.

Factors affecting education management

Xi Shengyang (2009) suggested that policies and regulations are one of the most important factors affecting educational management. The policies and regulations of the state stipulate the management system, educational content, teaching standards and other aspects of the school, which provide guidance for the educational management of the school. Under the guidance of policies and regulations, schools can better plan and manage educational resources and improve the quality and effect of education and teaching.

Wang Shan (2018) pointed out that system construction is the root of educational management. Educational management system is the most important factor related to the success or failure of school educational management, because as a system, it first provides a macro sense of the background for the management of the school, and what kind of system fundamentally determines the mode and method of educational management of the school. Management system of loose or strict will affect the quality of teaching and learning in colleges and universities, the relevant educational administrators will be managed in this way. In the final analysis, the education management system is the quality of teaching, management quality supervision and control, through the hard constraints can urge the relevant education management workers to rationally organize their work, for the construction of all aspects of the school has an extremely important impact.

Zhezvanguli. Abbas (2016) believes that the external environment, such as the campus atmosphere, is also an important factor related to the quality of educational management. As a soft resource of the objective environment of the school, the school climate influences the learning environment of the school and determines the work of the educational administrators. For the development of the school, the campus atmosphere is the style and attitude of the entire campus teaching and other aspects. What kind of campus atmosphere has what kind of educational management environment,

which to a large extent for the implementation of the power of educational administrators to lay the foundation. Therefore, for education management, it is necessary to be able to start from the campus culture and other soft power to improve the competitiveness in this area, and constantly realize the progress and reform of education management.

Wang Yeting (2023) believes that the performance appraisal of educational work is the main content of educational management, or the performance appraisal of educational work is a direct reflection of educational management. As a place of talent cultivation, schools have high requirements and constraints on teachers or staff engaged in other management work, so there are high constraints on the way of performance appraisal. Generally speaking, the stricter the performance appraisal method is, the more it can greatly motivate the relevant educators to enrich their own knowledge reserves, and strengthen their sense of responsibility and ability to continuously promote the improvement of teaching quality. However, due to the existence of factors such as the expansion of the school scale, it will cause this performance appraisal method is not flexible enough to suppress the enthusiasm and enthusiasm of the teachers, so that the educational work becomes rigid.

Li Xue (2017) points out that socio-economic factors have an influential role in educational management, noting that these factors play a key role in educational management. Specific manifestations of socio-economic factors in the practice of educational management. For example, socio-economic factors play an important role in education budgeting, education resource allocation, and education policy making. Socio-economic factors have an important impact on educational management reform. In the process of educational management reform, the socio-economic background needs to be fully considered in order to realize the effectiveness and efficiency of educational management. The role of educational administrators changes under the influence of socio-economic factors. Educational administrators need to have interdisciplinary knowledge and skills to cope with the complex and changing socio-economic environment. Socio-economic factors have an important impact on educational effectiveness assessment. Li Xue suggests that educational effectiveness assessment should pay attention to the influence of socio-economic factors in order to more accurately reflect the actual effects of educational management. According to Li Xue, the importance of socio-economic factors in education management should be fully recognized, and theory and practice should be combined to promote education management reform and improve the quality and level of education management.

To sum up, there are many factors affecting educational management, including policies and regulations, educational resources, teachers' quality, management mode, students' needs, social environment, technological development, organizational culture and so on. In the actual education management, it is necessary to consider the influence of various factors according to the actual situation, take scientific and reasonable management measures, improve the effect and quality of education management, and promote the overall development of the school.

Sustainable learning ability

The concept of sustainable development

Sustainable development is the ability to meet the needs of the present without compromising the ability of future generations to meet their own needs. It emphasizes the coordination and integration of economic, environmental and social aspects.

Wu Xueling (2006) points out that China has a simple concept of sustainability in ancient times. During the Spring and Autumn and Warring States Periods, there was the idea of protecting pregnant and spawning birds, animals, fish, and turtles for "sustainable utilization" and the decree of sealing off mountains and forests to open bans periodically. Confucius advocated the idea of "fishing but not planning, cruising but not shooting". Before his death, King Wen of Zhou instructed King Wu to "not raise the catty and axe in the mountains and forests at any time, so as to make the grass and trees grow; not enter the net and netting in the rivers and swamps at any time, so as to make the fish and soft-shelled turtles grow; and not fawn and not ovipositing, so as to make the birds and beasts grow. That is why fish and turtles return to their abyss, birds and beasts return to their forests, and orphans and widows who work hard depend on them for their livelihood."

In 1987, Brundtland was the first country in the world to introduce the concept of "sustainable development" (Wei Wei, 2003), and during the 15th session of the United Nations Environment Programme (UNEP) Governing Council, held in May 1989, the Statement on Sustainable Development was adopted after repeated consultations. The concept of sustainable development emerged in response to the changing times, socio-economic development and the needs of human society, and in 1987, the World Commission on Environment and Development submitted a report to the United Nations entitled "Our Common Future", which proposed a model of "sustainable development" that could satisfy the present needs of mankind while sustaining its future survival and development, and was well received by all countries. The model of "sustainable

development" has been endorsed by governments and environmental organizations around the world, and the concept of development put forward in the report has been popularly referred to as the "concept of sustainable development". Sustainable development refers to "development that meets the needs of the present without diminishing the ability of future generations to meet their needs" (Zhang Yanliang, 2018).

Chen Ying (2000) Social sustainable development is concerned with the overall well-being of human society, including but not limited to education, health, social justice, cultural diversity and inclusiveness. It emphasizes on meeting people's basic needs while improving their quality of life and social participation to build a just, equal and vibrant society. Sustainable social development focuses on safeguarding citizens' rights, promoting gender equality, strengthening social security and fostering global cooperation to achieve common prosperity and development.

Wan Jinbo (2005) Ecologically sustainable development refers to meeting basic human needs and realizing economic and social development without compromising the health, stability and integrity of natural ecosystems. It emphasizes measures to protect biodiversity, maintain the natural resource base, reduce environmental pollution and respond to climate change to ensure the sustainability of the Earth's life support system. Ecologically sustainable development requires the realization of a virtuous cycle of economic development and environmental protection, the promotion of green and low-carbon development, and the promotion of harmonious coexistence between human beings and nature.

Yu Shan (2023) Sustainable economic development refers to the ability of a country or region to maintain its economic vitality, wealth accumulation, and productivity enhancement while meeting the needs of the present generation without jeopardizing the needs of future generations in the process of development. It emphasizes economic growth while focusing on industrial restructuring, efficient use of resources, technological advancement, and upgrading of innovation capabilities, so as to achieve long-term stable and high-quality economic development.

Xi Jinping (Speech at the Twentieth Meeting of the Council of Heads of State of the Shanghai Cooperation Organization, November 10, 2020) (Xi Jinping, 2020) pointed out that true development is when everyone develops together, and sustainable development is good development. We should uphold the development concepts of innovation, coordination, green, openness and sharing, expand the space for practical cooperation, and help economic recovery and improve people's livelihoods. Human beings live in the

same global village, and the trend of the times of peace, development, cooperation and win-win cooperation is unstoppable. Only by solidly promoting sustainable development can people of all countries lead a good life and human society usher in a better tomorrow. We should join hands with all parties in the world, adhere to the people-centered development ideology, place the promotion of development and protection of people's livelihoods at the forefront of global macro policies, implement the United Nations 2030 Agenda for Sustainable Development, and jointly promote global development towards a new stage of balance, coordination and inclusiveness.

Fu Ying (2015) points out that Chinese traditional wisdom can play a great reference role in solving ecological problems for us today. The existence of the Confucian order in contemporary China means that it is important to recognize the role that the government can play in protecting the environment, while at the same time respecting the environmental order formed by society from the bottom up, thus creating a balance between the two orders of government and society. He also suggested that we should think about what kind of modernization we need if we are to coexist with the earth. This is not a simple academic question, but a philosophical one.

To sum up, sustainable development is a comprehensive concept covering economic, social and ecological aspects. It seeks to meet the needs of the present generation without compromising the needs of future generations, and to realize the long-term goals of economic prosperity, social justice and ecological health. In order to achieve sustainable development, integrated policies and actions are needed to promote economic transformation, strengthen social construction and protect the ecological environment, so as to realize the long-term stability and high-quality development of human society.

Theories of Learning Ability

Although many famous foreign scholars have been working on the substantive study of learning ability, there is no consensus on the issue of how learning ability is defined. Most scholars believe that learning ability is equivalent to intelligence. W.F. Dearborn (1988) thinks that "intelligence is the ability to learn or the ability to benefit from experience". According to A.L. Gates (2004), "Intelligence is a combination of the ability to learn". The International Commission on Education for the 21st Century (ICE21) indicates that the four pillars of education are learning to know, learning to do, learning to live, and learning to live together, which fully explains that learning will become the way to realize

people's selves, and this idea has gained wide acceptance in the international community as soon as it was put forward (Pan Liying, 2022).

Domestic scholars have held their own views on the discussion of the essence of learning ability. Pi Liansheng (1997) proposed from the perspective of the learner's intelligence that the goal of intellectual education is to develop students' intelligence, and learning ability is equivalent to intelligence. The goal of education is to develop students' acquired cognitive abilities, which need to be realized through acquired education and environmental influences. According to Li Fengqin (2002), learning ability refers to the learning methods that students master under the guidance of teachers, i.e., "knowing how to learn". Long Chengzhi and Liu Zhimei (2016) believe that learning ability refers to the degree of applying existing knowledge to solve problems, that is, the ability to learn how to learn, which is expressed in the individual generalized experience. Zhang Zhongming, Li Hong, Du Jianqun (2005) and others believe that learning ability refers to an intrinsic trait of an individual, which is formed and developed in practical activities, and can cause changes in the individual's behavior and thinking, and this is a kind of change is stable and lasting. While Sui Lu (2023) believes that learning ability is a personality trait that students use scientific thinking to independently collect information, process and express it, and transform it into their own abilities.

Lin Chongde (2015), who has been working on the study of learners' mental ability, found that ability always has to be associated with a specific activity. From this point of view, he proposes that in order to study learners' learning competence in school education, it is also necessary to find the "attachment point" of the competence, which is the subject activity. Disciplinary competence is a synthesis of the student's intelligence and abilities in the course of a particular disciplinary activity. In this context, "subject competence" can be regarded as basically equivalent to the learner's ability to learn. This is a further development of the scholastic competence theory, which explains the difference between intelligence, ability and disciplinary competence, but it still serves to clarify the essence of disciplinary competence.

Bi Hualin (2000) has resonated with stakeholders by presenting ideas about learning competence from an information processing perspective. He believes that the formation and development of competence cannot be separated from activities, and that learning competence is formed and developed in learning activities, and it is a personality characteristic of students who use scientific learning strategies to independently acquire information, process and utilize information, and analyze and solve practical problems.

Vincent Yu (2021) suggests that in order to develop learners' learning ability, learners should first learn various knowledge and skills, and then use these knowledge and skills to integrate and organize them into learning strategies to solve practical problems. In the process of integrating various strategies to solve practical problems, correct behaviors are slowly formed. That is, in the learning activities to achieve the deep integration of the learner's external behavior and the learner's internal knowledge, skills and cognitive strategies, which formed the learner's learning ability. Therefore, any learning activities are inseparable from the knowledge base, skill base and cognitive strategy regulation of the learner, once detached from these factors, the cultivation of the learner's learning ability is like water without a source, which is impossible to talk about.

To sum up, learning ability refers to a personality trait in which students master the scientific learning methods and skills needed in the learning process through the guidance of teachers, so as to independently acquire information, process and utilize information, analyze and solve practical problems, and it is a combination of various abilities to successfully complete learning activities, including perception and observation, memory, reading and problem-solving abilities. In an educational setting, the development of learning competence goes hand in hand with the teaching and learning process. For individuals, learning ability refers to the sum of various abilities and potentials to learn, including the ability to hold and store the type and amount of knowledge and information, the type of behavioral activity patterns, the ability to replace old and new information, etc., which is specifically expressed in how to learn, that is, what is usually referred to as "knowing how to learn", rather than the learning content and learning results. Learning ability is the foundation of all abilities. Learning ability is the foundation of all abilities, therefore, students need to "know how to learn" in order to realize "learning" to learn and continuously improve their learning ability.

Theory of Learning Approach

Sun Zhichang (2010) believes that learning approach (Learning Approach or Learning Style) is an important concept in contemporary educational theory research. Learning approach refers to the way a student takes in the learning process. It can also be seen as a set of ideological principles or related practical beliefs behind personal learning motivation and learning behavior. He believes that the current academic interpretation of it is not exactly the same, and there are mainly two views. Viewpoint 1: Learning approach is the basic behavior and cognitive orientation of students when completing learning tasks. It does not refer to specific learning strategies and methods, but the basic characteristics

of students in terms of autonomy, inquiry and cooperation. Viewpoint 2: Simply put, learning approach is the way people have or prefer when learning, that is, the way learners show personal characteristics when studying and solving their learning tasks. Learning approach is the sum of learning strategies and learning tendencies that learners consistently show. Learning strategy refers to a series of steps taken by learners to complete learning tasks or achieve learning goals, among which a specific step is called a learning method.

Chen Junzhuo (2024) proposed that learning methods can usually be divided according to students' initiative, exogenous, and characteristic characteristics, focusing on learning strategies, processes, and behaviors, guiding students to effectively apply learning methods in learning, so that they can gain more sense of accomplishment from learning, thereby improving learning efficiency.

Active learning methods refer to learning activities such as students taking the initiative to implement learned knowledge and skills in the process of mastering knowledge and solving problems. Active learning is a learning method that is not guided by teachers' opinions, but driven by students. It pays more attention to the learners' own learning motivation, allowing students to experience a sense of accomplishment in learning, thereby stimulating their interest in learning, actively adjusting their learning thinking, and learning better.

Exogenous learning refers to learning by using external resources. It mainly refers to learners applying known knowledge to new situations. In other words, it involves obtaining information, knowledge, and skills from the outside, but it is essentially a process of learners' autonomous thinking, requiring learners to understand and process external resources from a new perspective and method.

Characteristic learning style refers to the learning style determined by the individual's own characteristics in different learning environments. It focuses on the individual characteristics and relationship networks of learners. It can help learners understand their own learning characteristics and improve learning effects by focusing on the lack of development.

The above three learning styles are important learning strategies. Therefore, educators should consider how to use these three learning styles in the school environment to guide students' learning so that students can learn effectively and improve learning effects.

In response to the above different learning styles, schools and education departments can also propose different measures to support students' learning. First, schools can regularly carry out some activities to help students understand different learning styles and adjust learning strategies accordingly, such as holding special lectures and learning seminars; in addition, schools can also set up specific learning resource service centers to fully release learning resources and provide students with rich knowledge resources, equipment and practical activities; in addition, schools can also design a series of evaluation mechanisms to determine students' actual learning status, guide students to take effective learning behaviors, and enable them to gain a real sense of achievement in learning.

Some scholars believe that learning style refers to a learning mode selected by a learner according to his or her own characteristics in order to achieve the most effective learning purpose. Men Huihua (2023) proposed that it can be divided into autonomous learning, cooperative learning and integrated learning.

Autonomous learning refers to learning knowledge through active exploration and practice, rather than just accepting knowledge taught by traditional teaching methods. Autonomous learning can cultivate learners' independent thinking ability, timely summarize, analyze, summarize and systematic learning methods, so that learners can deeply understand the knowledge they have learned. Autonomous learning emphasizes the subjective initiative of learners, which allows learners to think, understand, discover and grasp the knowledge they have learned more deeply.

Cooperative learning is a learning method in which learners cooperate, analyze, discuss, help and support each other. It can not only improve learners' learning efficiency, but also enrich learners' experience and understand and grasp the knowledge they have learned more deeply. At the same time, cooperative learning can also allow learners to learn mutual respect, friendship, tolerance and harmony, and improve their sense of responsibility, cooperation and problem-solving ability.

The integrated learning method is to integrate autonomous learning and cooperative learning methods, give full play to the advantages of each learning method, and enable learners to effectively combine autonomous learning and cooperative learning to maximize their own learning effects. In the process of integrated learning, learners can encourage and help each other, listen to each other, build trust relationships, stimulate the enthusiasm for autonomous learning, grasp the initiative of knowledge, and make learning meaningful.

In short, the learning method is an indispensable part of a person's learning process. It can be carried out by students independently, or the school can provide a specific learning environment to support and guide students' learning to promote students' effective learning, help them achieve their own development with higher efficiency, and make the learning process a happy experience. Different learners have different learning methods, and these learning methods also have different characteristics. More importantly, through the correct learning method, learners can achieve the greatest efficiency. In today's educational environment, the choice of learning methods can greatly affect learners' learning outcomes. Therefore, learners should make full use of various learning methods according to their own situation in order to exert their learning efficiency and achieve their learning goals.

Theory of learning content

Illeris Knud (2007) believes that content is about learning. Learning ability is a general ability that is relatively independent of the specific content that students learn. In the future, students should learn to actively expand their learning content, think about and reflect on their learning purposes at any time, and develop the habit of lifelong learning. Constructivism believes that learning is the self-construction of learning content and the construction of the structure of new learning content and previously learned knowledge. Studies have found that most college students currently do not have enough depth in learning, and more than half of the students cannot understand the content they are learning and cannot connect the content they are learning with previous knowledge or social reality.

Gong Lina (2021) believes that learning content refers to the sum of knowledge, skills, and behavioral experiences that learners are required to learn systematically in order to achieve teaching goals. The work of analyzing learning content is based on the overall teaching objectives, aiming to define the scope and depth of teaching content and reveal the connection between the various components of learning content to ensure the content validity of optimal teaching. The scope of learning content refers to the breadth of knowledge and abilities that learners must achieve, and the depth determines the depth of knowledge and the quality level of abilities that learners must achieve.

Cynthia Luna, Scott, et al. (2017) believe that the analysis of learning content is related to both "what to learn" and "how to learn". There are three major areas of learning content: cognitive skills, motor skills, and emotional attitudes. The relationship between these three areas is very close. Without certain emotional attitudes and operational skills,

it is difficult to learn certain content in the cognitive field. Similarly, it is unrealistic to learn a motor skill or form a certain emotional attitude without relevant basic knowledge.

The theory of learning content covers the process of how learners acquire, organize, and understand information and knowledge. The following are several important learning content theories:

1. Constructivist Learning Theory: Lu Wanting (2024) mentioned in his paper that constructivist theory believes that learning is an active and constructive process, and learners build new understandings through interaction with existing knowledge and experience. This theory emphasizes how learners construct knowledge through personal meaning and understanding, rather than simply accepting external information. In the theory of learning content, constructivism reminds us to take into account learners' prior knowledge and experience when designing teaching activities and resources to promote deep learning and understanding.

2. Cognitive Load Theory: Wang Yu (2022) mentioned in his doctoral dissertation that cognitive load theory focuses on the cognitive load of learners when processing information, and proposed methods to reduce cognitive load to optimize learning effects. In the theory of learning content, this theory prompts us to design clear and structured learning content, and avoid excessive information and complex expressions, so as to help learners absorb and understand knowledge more effectively.

3. Theory of Multiple Intelligences: Zhao Junhua (2001) pointed out in his paper that the theory of multiple intelligences proposed by Howard Gardner believes that everyone has multiple types of intelligence, such as linguistic intelligence, logical-mathematical intelligence, spatial intelligence, etc. In the theory of learning content, this theory encourages diverse learning resources and methods to support different types of intelligence development and learning styles.

4. Connectionist Learning Theory: Zhang Ying (2016) mentioned in his paper that connectionist theory believes that learning is formed through connections in neural networks, emphasizing the association and connection between knowledge and concepts. In the theory of learning content, this theory reminds us to consider the connection and relationship of information when designing learning content and help learners establish meaningful connections in the knowledge structure.

5. Sociocultural Theory: Qin Lili et al. (2021) mentioned that sociocultural theory emphasizes the influence of social and cultural environment on learning, and believes that learning is part of social practice. The theory of learning content, this theory reminds

us to consider the social and cultural background when designing learning resources and activities to promote the meaning construction and social interaction of learning.

In summary, these theories provide a variety of perspectives and methods for education and learning design, helping educators and designers to better understand the learning process and learners' needs, so as to effectively design and implement learning content. Choosing theories and methods suitable for specific learning scenarios and learners' characteristics will help improve learning effects and results.

Theory of Learning Mode

Guo Xiaoming (2024) sorted out learning methods and learning modes and believed that "learning mode is more manifested as the sum of learning strategies or methods frequently used by learners, which is stable and systematic". Therefore, whether it is a hybrid, personalized learning mode, or an autonomous learning mode, the learning mode is manifested as the learning method and learning strategy that students tend to choose most of the time during the learning process.

Huang Guiyin (2023) believes that there are currently three main types of college students' learning modes: one is a pure offline learning mode; pure other learning is a more traditional learning mode, in which the teaching space is a classroom. The second is a pure online learning mode. Pure online learning means that the student's learning process is completed entirely on the Internet information technology platform. The pure online learning mode is divided into two categories, one is non-live teaching and learning (that is, the online learning mode of the three major teaching platforms), and the other is live teaching and learning. The third is the online and offline hybrid learning mode. At present, offline teaching still has an irreplaceable role in online teaching, but online teaching methods can well make up for the many shortcomings of offline teaching. Therefore, the online and offline hybrid learning mode is more widely used in current students' learning.

Xin Yue (2024) believes that autonomous learning is a modern learning method that corresponds to traditional receptive learning. As the name suggests, autonomous learning takes students as the main body of learning and achieves learning goals through students' independent analysis, exploration, practice, questioning, creation, and other methods. First, autonomous learning is an internal mechanism that dominates learning, which is a combination of factors such as learners' attitudes, abilities, and learning strategies. That is the ability of learners to guide and control their own learning, such as the ability to set learning goals, the ability to choose different learning methods and learning activities for

different learning tasks, the ability to monitor the learning process, and the ability to evaluate learning results. Second, autonomous learning refers to learners' control over their own learning goals, learning content, learning methods, and learning materials used. Third, autonomous learning is a learning model, that is, which learners formulate and complete specific learning goals according to their own conditions and needs under the macro-control of the overall teaching goals and under the guidance of teachers. Of course, this learning model has two necessary prerequisites, namely, learners have the ability to learn autonomously and the education mechanism provides space for autonomous learning.

Li Benhai (2020) pointed out that inquiry learning is a learning method in which students actively participate, study problems based on their own conjectures or hypotheses, and use scientific methods under the guidance of scientific theories to gain the innovative practical ability, develop thinking, and independently construct a knowledge system in the process of research.

Wang Fei (2019) believes that cooperative learning refers to mutual learning with a clear division of responsibilities in order to complete common tasks. Cooperative learning encourages students to work together for collective and personal interests and realize their ideals in the process of completing common tasks.

In summary, learning patterns are learning behaviors of humans and animals. Due to different environmental conditions, different learning tasks, and different learning rules, they can be divided into many patterns. That is associative learning, non-associative learning, procedural learning or proficiency and skill learning, cognitive learning, emotional learning, taste-aversion learning, and imprinting learning. The most common is the learning process based on individual experience due to repeated presentation of external things, which can be called experiential learning; the corresponding is cognitive learning formed by one-time observation, insight, or imitation, which does not rely on repeated individual experience. This learning model is most developed in humans and higher primates; another common learning model is emotional learning caused by factors directly related to individual survival or racial continuation.

Theory of learning plan

The theory of learning plan involves how to effectively arrange learning time and resources to achieve the expected learning goals. The following are some common learning plan theories and methods:

1. Goal Setting Theory: Li Jiang (2013) mentioned in a conference paper that this theory emphasizes setting specific, measurable, and challenging goals to enhance individual motivation and effort. Learning plans should include clear short-term and long-term goals, which should be quantifiable so that progress can be evaluated and motivation can be maintained.

2. Self-Efficacy Theory: Dai Fenghui (2019) mentioned in her paper that this theory was proposed by Albert Bandera and emphasizes the individual's belief in his own abilities. In the learning plan, improving self-efficacy can be achieved by setting learning goals that are gradually challenging and providing appropriate support.

3. Cognitive Learning Theory: Wen Sulei et al. (2021) believe that this theory explores how learners learn by perceiving, understanding, and remembering information. An effective learning plan takes these processes into account and promotes deep understanding and application capabilities through appropriate learning methods and strategies.

4. Behaviorist Learning Theory: Sui Meirong (2002) publicly believes that this theory emphasizes that learning is a process formed by reactions to stimuli. Learning plans may include reward and punishment mechanisms to promote the desired learning behavior.

5. Constructivist Learning Theory: He Zhenlian (2011) believes that learning is an active process, and individuals construct new understanding and knowledge through interaction with existing knowledge. In the learning plan, this theory can be supported by providing exploratory learning opportunities and cooperative learning activities.

6. Sociocultural Theory: Wu Taiyang (2021) pointed out that this theory focuses on the impact of social and cultural environment on learning and believes that learning is part of social practice. Learning plans can promote learning effectiveness by emphasizing social interaction, cooperative learning, and cultural context.

Combining these theories and methods can help develop personalized and effective learning plans to support learners in achieving good academic achievements and personal development in various learning environments.

Definition of sustainable learning ability

According to Li Xiao, Wang Ying, and Zhang Liqun (2011), sustainable learning ability refers to the ability of a person to master effective cognitive strategies on the basis of a certain amount of cultural knowledge, and to be able to continue learning independently, including the ability to learn independently, the ability to learn by inquiry, the ability to learn by openness, the ability to innovate, etc. The development of sustainable learning

ability is the most important task of higher vocational college education. Cultivating the sustainable learning ability of higher vocational college students to realize their sustainable development, meet the current social needs, and realize the employment goal of students is the main task of current higher vocational college education. Measures for the cultivation of students' sustainable learning ability in higher vocational colleges and universities mainly include: enhancing teachers' professional learning ability; accelerating the pace of curriculum reform; increasing students' interest in sustainable learning and enhancing teachers' learning ability; advocating action-oriented teaching methods and triggering students' desire to explore, and so on.

Zhang Jianqun (2011) Sustainable learning ability is a kind of positive, active, and conscious self-improvement ability that runs through all courses of life and covers all aspects of personal development. The cultivation of students' independent learning ability can be started from the following aspects: first, change the role and realize the reform of teaching content; second, establish the "main" status of students; third, pay attention to the classroom teaching methods, through the use of heuristic teaching method, pay attention to the classroom to arouse students' empathy, and guide the students to think out of the box.

Hong Wenmei and Liu Shuhong (2012) elaborated on sustainable learning ability from the perspective of sustainable learning ability cultivation of undergraduates majoring in elementary education. They believed that the professional development of teachers relies on sustainable learning ability, and the cultivation of sustainable learning ability depends on teachers' learning. The sustainable learning competence necessary for teachers' professional development can be developed gradually in the professional learning prior to taking office. The cultivation of sustainable learning ability of undergraduates majoring in elementary education should be guided by the following three aspects: guiding students with advanced education and teaching theories to promote the formation of a good sense of knowledge construction; helping students to establish the concept of "independent learning" to develop their self-directed learning ability; and strengthening the teaching of practical courses to improve their ability of reflective practice.

Yu Chunmei (2014) pointed out that with the deepening of the research of scholars at home and abroad on the cultivation of college students' foreign language learning ability, the theory of sustainable learning ability has gradually had a great impact on foreign language teaching in China. With the advent of the information age, and the rapid

development of multimedia and network technology, people's way of life and learning is experiencing a historic and huge change, which makes the cultivation of college students' foreign language sustainable learning ability under the network teaching environment also become a task of the times.

According to Xu Ling (2020), we can learn from the research on the current situation of education for sustainable development in foreign countries that education for sustainable development is a regional and international challenge, and education is the key to a sustainable future. Cultivating students' ability to learn sustainably should be one of the goals of the experiment on reforming the teaching mode. He summarized the practices related to the teaching and learning process of the chemistry subject in his school, which drew on the specific application of e-learning teaching and learning, and the organic integration of periods inside and outside the classroom to develop students' sustainable learning capacity.

In summary, sustainable learning ability refers to the ability of a person to master effective cognitive strategies on the basis of a certain amount of cultural knowledge and to be able to learn continuously and autonomously. The requirement of sustainable learning ability of higher vocational students is that students not only have the ability to learn actively under the guidance of teachers but also can learn the ability to learn independently and autonomously in different environments and develop. From this perspective, the sustainable learning ability of higher vocational students is also a synthesis of learning motivation, learning ability, and learning perseverance.

Factors affecting sustainable learning ability

Sustainable learning ability (SLC) is an important topic in the field of education research, which aims to cultivate learners' ability to adapt to the rapidly changing social environment and continuously acquire new knowledge and skills. In recent years, with the acceleration of globalization and technological innovation, academic research on promoting sustainable learning capacity has been deepened. Several studies have shown that the school environment, teachers' professionalism, and students' personal traits and behaviors are core factors influencing the development of this competency (Barnett, 2023, Zhao & Suo, 2014, Xu, Jialu, & Li, 2023). This paper systematically reviews the relevant literature from three aspects: school factors, teacher factors and student factors, and summarizes the key driving factors and mechanisms affecting sustainable learning ability.

1. School factors

1.1 Curriculum Design and Teaching Resources

Schools play a vital role in curriculum design and the allocation of instructional resources. Several studies have pointed out that the flexibility of curriculum content and practical orientation are the key factors affecting students' ability to learn sustainably (Xu, Jialu, & Li, 2023). For example, Mao et al. (2020) found that project-based learning (PBL) curriculum design can effectively improve students' critical thinking and problem-solving skills compared with traditional knowledge-based courses. In addition, the introduction of digital teaching resources has also significantly improved the efficiency and depth of learners' acquisition of knowledge (Zhang & Deng, 2023).

1.2 School culture and support systems

The impact of school culture on students' ability to learn sustainably cannot be ignored. A campus culture that encourages innovative, lifelong learning can significantly enhance students' awareness and motivation to learn (Barnett, 2023). In addition, the support systems established by the school, such as career counseling, psychological counseling, and academic support centers, provide students with the necessary resources and assistance to improve their resilience to complex problems (Qin, Zhang, & Wang, 2018).

1.3 Connection of the school to the external environment

The school's collaboration with external environments such as businesses and communities provides students with real-world learning opportunities. Research has shown that through the school-enterprise cooperation model, students are able to participate in real production practices, so as to better understand the relationship between knowledge and practical work (Lu & Wei, 2015). For example, Japan's dual education model has successfully achieved deep collaboration between schools and companies in talent development, providing students with high-quality practical opportunities (Amano, 2018).

2. Teacher factors

2.1 Professional competence of teachers

Teachers' professional competence and teaching strategies are important factors affecting students' ability to learn sustainably. A high level of subject knowledge and teaching skills can significantly improve student learning outcomes (Chen, 2023). For example, Shi (2018) found that teachers who used heuristic teaching and problem-based learning were better able to motivate students' exploratory and creative thinking.

2.2 Teachers' communication and guidance skills

Teachers' communication skills play a key role in building a good teacher-student relationship. Studies have shown that teachers' support and feedback on students' learning

process can effectively enhance students' motivation and self-confidence (Lu & Wei, 2015). In addition, the teacher's guidance style has an important impact on students' ability to self-regulate learning (Zhao & Suo, 2014).

2.3 Teachers' attitude towards lifelong learning

As role models for students, teachers' lifelong learning attitudes and career development plans have a profound impact on students (Wang & Zhang, 2023). For example, Müller & Gangl (2019) suggests that when teachers are actively involved in vocational training and academic research, their attitudes towards learning can indirectly motivate students to pay more attention to the relationship between learning and professional development.

3. Student factor

3.1 Learning motivation

Learning motivation is the core driver of students' sustainable learning ability. Barnett (2023) states that a high level of intrinsic motivation for learning can significantly improve students' learning initiative and persistence. In addition, Zhang & Deng (2023) has shown that course content that is closely related to employment can enhance students' extrinsic motivation, thereby promoting their motivation to participate in learning activities.

3.2 Self-directed learning ability

Students' ability to learn independently is considered to be the foundation for sustainable learning. Lu & Wei (2015) emphasized that students with strong self-directed learning ability are better able to plan their learning goals and manage their learning time, so as to maintain a high degree of adaptability in complex learning environments. In addition, IT-based learning platforms, such as online learning resources, facilitate students' self-directed learning (Mao et al., 2020).

3.3 Social and Collaborative Skills

Students' social skills and teamwork skills are also important factors influencing sustainable learning. Through teamwork, students are able to gain a deeper understanding of complex problems and learn how to work effectively with others (Qin, Zhang, & Wang, 2018). In addition, participating in collaborative projects in multicultural contexts can significantly improve students' communication skills and intercultural adaptability (He, 2023).

Table 2.1 Factors Influencing Sustainable Learning Ability

Factor Category	Specific Factors	Key Points	References
School Factors	Curriculum Design and Resources	Project-oriented curriculum and practice-based teaching resources enhance students' critical thinking and practical skills.	Xu et al. (2023); Mao et al. (2020)
	School Culture and Support Systems	A campus culture that fosters innovation and lifelong learning, along with career counseling and academic support, boosts students' motivation.	Barnett (2023); Qin et al. (2018)
	School-External Environment Links	Collaboration with industries offers real-world practice opportunities, deepening students' understanding of knowledge and work applications.	Lu & Wei (2015); Amano (2018)
Teacher Factors	Teachers' Professional Expertise	High-level teaching skills and subject knowledge improve students' learning outcomes.	Chen (2023); Shi (2018)
	Communication and Mentorship	Effective communication and timely feedback enhance students' learning motivation and confidence.	Lu & Wei (2015); Zhao & Suo (2014)
	Lifelong Learning Attitudes	Teachers with lifelong learning attitudes inspire students to focus on career development and continuous learning.	Müller & Gangl (2019); Wang & Zhang (2023)
Student Factors	Learning Motivation	Intrinsic motivation combined with career-oriented curriculum drives students' learning persistence and initiative.	Barnett (2023); Zhang & Deng (2023)
	Self-Regulated Learning Skills	Self-regulated learners better plan goals and adapt to complex	Mao et al. (2020); Lu & Wei (2015)

Factor Category	Specific Factors	Key Points	References
		environments, supported by digital resources.	
	Social and Collaboration Skills	Teamwork and cross-cultural projects improve students' communication and collaboration skills.	Qin et al. (2018); He (2023)

In summary, the school's curriculum and resources, teachers' professional competence and attitudes, and students' motivation, self-directed learning and social skills all constitute the key factors influencing sustainable learning. These factors complement each other and together shape an educational ecosystem that supports the holistic development of students. However, future research should pay more attention to the following two directions: first, to explore the mechanism of these factors in different cultural contexts; Second, develop targeted education interventions to more effectively promote students' ability to learn sustainably. Through these studies, educators can more comprehensively understand and respond to the challenges in education transformation.

Higher Vocational Institutions

Higher vocational colleges

Higher vocational college is the abbreviation of higher vocational education colleges, which provide higher education services. The academic system of higher vocational colleges is usually three years, with full-time specialized level higher vocational education as the main content. Higher vocational colleges mainly provide higher vocational education at the specialist level, and through full-time, three-year study, they aim to cultivate high-level technical and applied specialists with necessary theoretical knowledge and strong practical ability, comprehensive quality, and business ability.

According to the relevant provisions of the Ministry of Education, non-teacher training, non-medical colleges, and universities should be standardized school name suffix "vocational and technical colleges" or "vocational colleges", general institutions of higher learning teacher training, medical schools should be standardized school name. The suffix is "College College" (Reply to Recommendation No. 2396 of the Second Session of the 13th National People's Congress - Government Portal of the Ministry of Education of the People's Republic of China, 2019). As of June 15, 2023, there were a total of 3,072 colleges

and universities in China, of which 2,820 were ordinary colleges and universities, including 1,275 undergraduate colleges and universities and 1,545 higher vocational (specialized) colleges and universities.

Xu Yuanjun (2007) believes that the purpose of the founding of higher vocational colleges and universities is to cultivate application-oriented talents with high quality and high skills to meet the needs of social and economic development. It not only teaches students professional knowledge but also focuses on cultivating students' practical operation ability, innovation ability, and teamwork spirit.

Ji Wenting and Xia Jinxing (2015) pointed out that higher vocational colleges and universities play an important role in vocational education in China and are an important part of higher education. In the whole education system, higher vocational colleges and universities undertake the important task of cultivating highly skilled, technical, and applied talents, and provide professional talents for the first line of production, construction, and management of the country.

Luo Haiyan (2017) pointed out that higher vocational education is an abbreviation of higher vocational education. Different from ordinary higher education which mainly cultivates academic talents, the goal of higher vocational education is to cultivate technical application talents. While cultivating students' professional knowledge, it also pays more attention to knowledge. As well as the application of skills, i.e. education at the junior college level. Higher education in China is divided into undergraduate and specialized Colleges, known as junior colleges, include two forms of education, higher vocational education and junior colleges. Higher vocational colleges differ from specialized colleges only in the type of school and professional environment. Higher vocational colleges are vocational institutions that specialize in teacher training, medicine and public safety. Junior colleges are the colleges of higher learning that remain after the abolition of these colleges. Higher education in China is dominated by higher vocational education.

Xu Mingxia (2018) points out that higher vocational colleges are characterized by the following features: first, innovation in the form of education, the combination of formal and non-formal education, and the co-development of the two. The second is the reform of academic qualifications, the development of non-academic education, and the equal emphasis on academic and non-academic education. The third is the improvement of the education chain. While developing pre-vocational education, it is also important to focus on expanding post-vocational education. The fourth is resource integration, not only to

develop employability, but also to move towards the integration of industry and education as a resource center.

Li Jinsong and Li Chi Lei (2017) Higher vocational colleges and universities, also known as higher vocational education institutions, are educational institutions that implement higher vocational education, and their educational level is located between specialties and undergraduate degrees. The main task of higher vocational colleges is to cultivate high-skilled talents to meet the social demand for specific occupational fields.

Peng Zhang and Yan Zhao (2022) mentioned that higher vocational colleges include both primary and undergraduate levels of education. It is emphasized that the higher vocational students in this study are those who participate in on-the-job internships and practical activities in colleges and universities.

Ma Yan (2023) Characteristics of higher vocational colleges and universities: 1. Vocational orientation: teaching activities in higher vocational colleges and universities are centered on vocational needs, emphasizing the cultivation of students' vocational skills and practical abilities.2. Application: teaching content is closely integrated with actual work, focusing on the combination of theory and practice, and cultivating the students' practical application ability.3. Diversity: the curriculum and teaching methods are flexible and varied in order to meet the needs of different Deep cooperation: deep cooperation with industries and enterprises to jointly develop teaching programs and provide internship opportunities to ensure the consistency between teaching contents and market demands. 4.

Wang Sheng (2023) Higher Vocational Colleges and Universities With the development of social and economic development and the adjustment of industrial structure, the demand for highly skilled personnel will continue to increase. Therefore, the development prospect of higher vocational colleges is very broad. In the future, higher vocational colleges and universities will pay more attention to practical teaching and school-enterprise cooperation to improve the quality of teaching and the employment quality of graduates. At the same time, with the development of science and technology and the expansion of application fields, higher vocational colleges and universities will also offer more professional courses related to emerging industries and cultivate more high-skilled talents to meet the needs of social and economic development.

Liu Wenxia (2023) pointed out that higher vocational colleges and universities are the training bases of practical technology skills, responsible for talent training, social service, scientific research, cultural inheritance and many other important tasks. They play

an important role in agricultural personnel training, farmer training and agricultural education. It has obvious advantages in technical services and other aspects, and plays an important role in the revitalization of rural talents in China.

Liu Haiming (2023) mentioned that both higher vocational education and general higher education belong to the fifth level of education. Higher education focuses on the cultivation of discipline-based talents, while higher vocational education focuses on the cultivation of technical and applied talents, paying more attention to technology and professionalism. Recognizing the talent cultivation mode, higher vocational colleges and universities take the principle of coordinated development of knowledge, ability and comprehensive improvement of quality as well as the cultivation of technical application ability as the main line, and strive to cultivate technical application talents with innovative spirit and practical application ability required by production and service lines.

To summarize, higher vocational colleges and universities refer to higher vocational education institutions, which are part of China's higher education system. These colleges and universities mainly provide professional vocational skills training and practical talent training for graduates of secondary vocational education and groups with equivalent academic ability. Compared with ordinary undergraduate colleges and universities, the educational objectives of higher vocational colleges and universities are more focused on cultivating students' professional qualities and practical skills, so that they can be more easily integrated into specific industries or occupational fields. Generally speaking, higher vocational colleges and universities play an important role in building a vocational education system oriented to the needs of society, cultivating a variety of professional and skilled personnel for society and promoting sustainable economic and social development.

Teaching Management of Higher Vocational Colleges and Universities

Higher vocational colleges and universities should formulate corresponding teaching objectives according to market demand and industry characteristics, and develop scientific and reasonable teaching plans and syllabi on this basis.

Cai Fangting (2017) At present, China's higher vocational education has entered a new stage of structural optimization, which requires the formation of a synergistic development pattern combining public and private education, academic education and non-academic training, and improving quality and efficiency while expanding the scale. For one thing, in the face of individual differences in student sources, higher vocational colleges and universities need to establish a multi-level, multi-gradient and diversified

teaching management mode, with a view to adapting to the talent cultivation objectives of different specialties and the talent needs of different industries. Secondly, the innovation of teaching management should be equipped with complete software and hardware facilities and strengthen the construction of management team, so as to realize the optimal allocation of educational resources.

Li Jinbao (2016) Deepening teaching reform is an inherent requirement for higher vocational colleges and universities to achieve sustainable development, and it can also provide a constant power for realizing the integration of industry and education. Innovative teaching management work is conducive to promoting the deep development of teaching reform in higher vocational colleges and accelerating its work process. Teaching management is related to the quality of classroom teaching and talent cultivation, and its reform and innovation means that professional curriculum construction, talent cultivation programs, teaching content and methods need to be adjusted and optimized, which in turn promotes the deepening of teaching reform.

Lai Shilin (2021) promotes teaching management informatization as an inevitable trend of innovative teaching management in higher vocational colleges and universities, which can provide solid technical support for the improvement of the quality of teaching and the level of faculty management.

Zhu Zhihong(2013) Teaching management in higher vocational colleges and universities is a management science with both academic management and administrative management, and the relevant personnel must not only have business ability and management knowledge, but also need to have dedication, innovation consciousness, stress resistance and other qualities.

To summarize, for higher vocational colleges and universities, the reform and innovation of teaching management is not a simple task, it is not a pop-up, but requires the joint participation and mutual support of multiple forces, especially the community and school-enterprise cooperation units. Higher vocational colleges and universities should give full play to the subjective initiative of the white body, seize the favorable opportunity of modernized teaching reform, and comprehensively and effectively improve the teaching management level of the school from the concept of updating, information technology construction, faculty team building, management mode reform and other aspects. In today's knowledge society and the rapid development of the digital economy, higher vocational colleges and universities should be good at analyzing and summarizing the problems that occur in the process of teaching management, formulating a scientific

teaching management system and adopting advanced teaching management means, based on the actual development of the school, and adhering to the concept of student-oriented reform and innovation of teaching management.

Definition and Characteristics of Students in Higher Vocational Colleges and Universities

Students of higher vocational colleges and universities are those who study in China's higher vocational colleges and universities. After graduating from high school, they choose to enter higher education institutions that specialize in cultivating applied skills and practical operation ability to further their studies. The goal of higher vocational colleges and universities is to produce people with some knowledge of higher education, professional skills and technical knowledge. This is not to produce senior researchers, but to emphasize the practical and operational skills of applied technology in teaching and learning. Scholars have studied the educational objectives of higher education institutions and the characteristics of students in higher education institutions. The details are as follows:

The definition and characteristics of students in higher vocational colleges and universities, many scholars have given certain research conclusions, Chen Qin and Kong Jin (2019) mentioned that college students of higher vocational colleges and universities are specialists who study in higher vocational colleges and universities and receive higher vocational education with certain practical ability, innovation ability and vocational literacy training.

According to Bian Hongning and Zhang Hongxia (2016), college students in higher vocational colleges should have high comprehensive quality, including professional skills, humanistic literacy, innovation ability and professional ethics.

Li Zhonghua (2010) mentioned that college students in higher vocational colleges and universities should have good psychological quality, including strong psychological adaptability, stress resistance, interpersonal communication ability and self-regulation ability.

According to Li Lina (2021), college students in higher vocational colleges and universities should have strong vocational quality, including vocational skills, vocational psychology, vocational ethics and vocational planning.

Wu Haihua (2024) suggested that students in higher vocational colleges must be students of higher vocational colleges, and these students should be educated in higher vocational colleges. The teaching content of higher vocational institutions focuses on the

development of practical skills, the improvement of technical skills and practical abilities, and the shaping of professional qualities and ethics. Compared with various types of higher education institutions such as traditional colleges and universities, higher vocational colleges and universities focus more on practical vocational applications in their educational objectives, and their curricula are completely close to the needs of the relevant occupations, which is more inclined to vocational education.

Wang Xinying (2017) pointed out that students in higher vocational colleges and universities have lower scores when they enter school, and they do not have a solid grasp of basic knowledge, but they think positively and have strong communication and coordination skills. There are more rural students in higher vocational colleges who are more familiar with their hometowns and their home countries. There is a stronger desire for entrepreneurship.

In conclusion, higher vocational colleges and universities are a kind of higher education institutions focusing on cultivating applied and skill-oriented talents. Compared with traditional theoretical education, vocational colleges pay more attention to practical teaching and emphasize the application of the knowledge and skills that students have acquired in the real work environment. Therefore, students in higher vocational colleges are characterized by strong practical ability, professional quality and high professional ethics.

Education Management Strategies

Strategies

The strategies studied in this paper refer to the strategies of educational management, that is, the educational management strategies for the development of students' abilities in higher vocational colleges and universities.

Strategy generally refers to the general name of the method and way to achieve the goal or the method to realize the goal according to its own conditions combined with internal and external circumstances.

Guanzi - Seven Laws" said: even the plan can't figure out the number of transportation, but want to do great things, like going to the waterway without a boat, which is very dangerous, where the "plan number of transportation" is equivalent to the modern meaning of "strategy", which can be seen that the strategy management in deciding the direction of things and the effect of achieving the goal. This shows the importance of strategy management in determining the direction of things and the effect

of achieving goals. In Western management literature, the word "strategy" (Strategy) comes from the Greek word (Strategos), meaning "The Art of General" (The Art of General), i.e., the general's method of using troops. Therefore, strategy can be interpreted as tactics, strategy, policy. Later, the term "strategy" was introduced into management science, and the main definitions are as follows.

Alfred D. Chandler (2008) defines strategy as a method of designing an organization's long-term goals and decisions, as well as the actions and asset allocations needed to achieve them.

W.F. Glueck, (1980) considers strategy as a set of coherent, coordinated, broad and integrated plans designed to achieve the basic goals of an organization (H.F. Lee, 2010).

Ohmae Kenichi (1981) suggests that the only goal of a strategy plan is to design the organization to be as efficient as possible to gain a sufficient advantage over its competitors. So strategy means trying to change the power of the organization in the most efficient way possible and using that power to outperform competitors (Robbins, 2004).

The Stanford Center for Strategic Studies study concluded that strategy is a means of pursuing a goal, and in the formation of this means, it reflects changes in the environment of the design organization, the use of major resources, and guidelines for the direction of the design organization (Stephen P. Robbins & Mary Coulter, 2017).

Kenny Andersen defines strategy as the form of goals, and the major policies and plans to achieve them, identifying the undertakings that the design organization will engage in and the category to which the organization should belong (Shiyong Xu, 2020).

Henry Mintzberg (1989) proposed the "5P" model of design organization: Plan, Ploy, Pattern, Position, and Perspective. These five models illustrate the concept of organizational design strategy from different perspectives: first, strategy is a plan. Strategy is a purposeful, anticipatory, and organized course of action. As a plan, the strategy should indicate the direction and path of development, including a series of policies to deal with a particular situation, which is "planning before action." Secondly, strategy is a plan. Strategy can be a kind of action process, means, and tactics, according to the environment and competitors, to take different measures to achieve the strategic purpose; it is a competitive game to defeat the opponent's tool. Again, strategy is a pattern. Strategy can be embodied in the procedures and norms followed by the organization's behavior, that is, the entire strategy as a "behavioral flow" of the movement process. Strategy is a plan or model of the two definitions that are independent of each other. In practice, plans are often not implemented, while patterns may be formed without prior planning. Therefore,

a strategy positioned as a "plan" is a designed strategy, while a strategy defined as a "pattern" is a realized strategy. Fourth, strategy is a positioning. Strategy is an organization's judgment of what is unknown about itself in its environment. Thinking of strategy as positioning is about developing effective competitiveness through the proper allocation of resources. Finally, strategy is a perception. Strategy expresses the way an organization inherently perceives objective time and refers to the values of the business. The definition of strategy as a concept emphasizes the abstract nature of strategy, the essence of which lies in the fact that, like values, cultural ideals, and other spiritual content shared by members of the organization, the concept of strategy is to be formed and shared through the expectations and behaviors of the members of the organization.

In summary, strategy is about setting goals and developing ways to reach them.

Theory of Strategy

Strategy-related theories mainly involve how organizations, enterprises, or individuals formulate and implement long-term goals and plans in the face of complex environments and competition. There are many strategic theories, including Porter's competitive strategy, resource-based theory, five-force model theory, core competence theory, dynamic Ability theory, etc.

Porter's Competitive Strategies: Michael Porter proposed three basic competitive strategies: cost leadership strategy, differentiation strategy, and concentration strategy. Cost leadership strategy gains a competitive advantage in the industry by reducing costs; differentiation strategy gains a competitive advantage in the market through unique products or services; concentration strategy focuses on specific market segments to achieve benefits.

Werner (1984) proposed the resource-based theory, believing that enterprises are a collection of various resources and that enterprise growth is the result of the enterprise's overall planning and coordination of its own resources and management functions. This theory has a new understanding of enterprise growth, believing that the driving force of enterprise growth is the enterprise's use of its production resources to form production services and that enterprise growth occurs under the impetus of the enterprise's unique power as an individual (usually the services or capabilities generated by the enterprise's mobilization of its resources), rather than the equilibrium forces of the market (Jay B. Barney, 2011). The resource-based theory establishes an analytical framework of "enterprise resources-enterprise capabilities-enterprise growth." The resource-based theory first assumes that the resources of enterprises are heterogeneous and that there are

differences in the resources owned by different enterprises. Even two enterprises in the same industry will accumulate different resources due to differences in the resources and capabilities they have when they are first established, the development process, and the judgment of the future during the operation process.

Five Forces Model: Porter's five forces model helps analyze the competitive environment of the industry. This includes the threat of potential entrants, the negotiation power of suppliers and buyers, the threat of substitutes, and the degree of competition among existing competitors. Understanding these forces can help companies formulate effective competitive strategies.

Prahalad, C.K., & Hamel, G. (1990) proposed the core competence theory. The core competence of an enterprise is a unique ability formed by the enterprise in its long-term business activities that is difficult for competitors to imitate. This Ability can bring competitive advantages and sustainable development to the enterprise (Wang Yi, 2004). The formation of core competence requires enterprises to accumulate, update, and strengthen continuously and requires enterprises to pursue excellence in innovation and development continuously.

David J. Teece (1992) proposed the dynamic Ability theory, which mainly examines how enterprises can integrate, build, and reconfigure internal and external resources and capabilities to generate a new Ability to adapt to a rapidly changing environment (Dana Gaines Robinson & James C. Robinson, 2011). The theory assumes that enterprises with high dynamic capabilities have more advantages than those with low dynamic capabilities. The purpose of this theory is to explain how enterprises use dynamic capabilities to create and maintain competitive advantages over other enterprises in the process of responding to and making the environment.

Based on Porter's Five Forces Model Theory, Wang Wei (2023) analyzed the development environment of Shandong's slimming cigarette industry from five aspects: raw material cooperation Ability, customer purchasing power, substitution threat, potential access power, and industrial competitiveness, and proposed relevant development strategies. They believe that Shandong Air China must accurately position its slimming cigarette brand, and on the basis of consolidating the existing slimming cigarette market share, increase innovative research, deeply explore the cultural and regional elements of Qilu, coordinate and grasp market demand and consumer preferences, improve the core competitiveness of Shandong's slimming cigarette industry, and strive for breakthroughs.

Wu Xiaojie and Yang Dandan (2023) explored how the institutional environment and enterprise capabilities jointly affect the omnichannel marketing strategy selection of retail enterprises by integrating institutional theory and resource-based perspectives. The proposed research model was verified by regression analysis and other methods. The regulatory effect regression shows that the regulatory environment will weaken the positive role of information system capabilities; marketing capabilities can enhance the role of information system capabilities.

Li Jian et al. (2024) used literature methods and logical analysis methods, combined with relevant communication theories and SWOT analysis methods, to analyze and study the dissemination of martial arts culture in the era of big data. They pointed out the advantages and disadvantages of martial arts culture in the era of big data, as well as the opportunities and challenges it faces. They pointed out that in the era of big data, the dissemination of martial arts culture must make full use of its advantages, seize opportunities, meet challenges, and make full use of its advantages. Based on the characteristics of news media, under the guidance of relevant national policies, actively cultivate and introduce talents, establish a coordinated and complete martial arts culture dissemination ecology, expand the dimensions of martial arts culture dissemination, and promote the better inheritance and development of martial arts culture.

In summary, strategic theory refers to a theoretical system that studies the principles and methods of formulating and implementing strategies under different circumstances. It is a discipline that studies the formulation, implementation, and evaluation of strategy involving the methods and processes used by organizations, enterprises, individuals, and other institutions. Different strategic theories have their applicable scenarios and conditions. It is necessary to select appropriate strategic theories or apply them comprehensively based on one's actual situation to achieve goals in different environments. These theories provide enterprises and organizations with a variety of strategic choices and analysis tools to help them maintain competitive advantages and achieve long-term success in a constantly changing competitive environment. Choosing theories and methods that are suitable for specific situations is crucial to the formulation and implementation of strategic plans.

Educational Management Strategies

Shi Chuntao and Hao Dongming(2019) believe that educational management strategy is a key means to achieve academic goals and improve academic quality.

Li Yongmao (2023) defined educational management strategies as action plans adopted by educational administrators to achieve academic goals in a specific environment.

Wang Hongcai (2019) emphasized that educational management strategies are the key to achieving educational management goals. Educational administrators need to develop and implement appropriate educational management strategies according to the actual situation.

Li Bin (2023) understands educational management strategies as effective measures and methods taken in the process of educational management according to the actual situation.

According to Tony Sampson (2009), the development of educational management strategies should be based on a comprehensive analysis of the internal and external environments of educational organizations, including educational objectives, resource allocation, human resource management, and educational and teaching reform(Chen, Hsiao-Bin, 2008). In addition, he emphasized that educational management strategies should have some flexibility to adapt to the changing educational environment. Tony Sampson stresses the importance of human resources in educational management and proposes human resource management strategies, including recruitment, training, motivation, and evaluation. These strategies aim to increase the job satisfaction of educators and stimulate their motivation, initiative, and creativity. Tony Sampson points out that financial management strategies are an essential part of educational management. Educational managers should allocate resources appropriately to ensure the economic health of educational organizations and provide strong support for education and teaching. Tony Sampson emphasizes that the quality of education and teaching is the core objective of educational management. He proposes strategies for education and teaching management, including curriculum management, teaching method reform, and student assessment. These strategies aim to improve the quality of education and teaching and promote the overall development of students. Tony Sampson believes that a good educational environment is the key to improving the quality of education and teaching. He proposed educational environment management strategies, including campus culture construction, facility and equipment updating, and safety management.

Jin Lu (2023) proposed that the development of educational management strategies should follow the following principles: 1. Goal-oriented principle: Educational management 323 strategies should clarify the educational goals and ensure that the

implementation of measures can promote the realization of educational goals.2. Principle of seeking truth from facts: Educational management strategies should be formulated by thoroughly investigating and researching the actual situation, to ensure the feasibility and relevance of the strategies.3. Principle of system optimization: Educational management strategies should focus on the synergy between various measures to form an organic whole and improve the management effect.4. Principle of continuous improvement: Educational management strategies should be continuously adjusted and improved according to the actual situation and development needs in order to adapt to the new challenges of educational management.

Shelly Keit (2010) emphasizes that the development of educational management strategies is a systematic process that includes the following steps: clarifying goals, analyzing the current situation, predicting trends, formulating programs, evaluating effects, and adjusting strategies(Xiaoyang Xue, 2010). In this process, educational leaders need to thoroughly consider internal and external factors to ensure the effectiveness and feasibility of the strategies. The implementation of educational management strategies is a synergistic process that requires the participation of many parties, including academic leaders, teachers, students, and parents. In the process of implementing strategies, educational leaders should give full play to the functions of organizing, coordinating, communicating, and motivating to ensure that the strategy can be promoted smoothly.

Liu Zhijun (2008) suggests that the following principles should be followed when formulating educational management strategies: clear objectives in line with reality; systematic thinking, holistic planning; innovation-driven, sustainable development; people-oriented, focusing on effectiveness; democratic participation, fairness, and impartiality; timely adjustment, dynamic optimization. Educational managers should focus on the following aspects during the implementation of the strategy: strengthening organizational coordination to ensure the smooth implementation of the strategy; optimizing the allocation of resources to protect the implementation of the strategy; strengthening the construction of the system to ensure the long-term implementation of the strategy; and focusing on evaluation and feedback to continuously improve the effectiveness of the strategy implementation.

Li Hongbo (2023) suggests that educational managers should focus on combining strategy research with practice and continuously explore and optimize educational management strategies through survey research, case analysis, and experience summarization to improve the level of academic management.

In summary, the formulation, implementation, evaluation, and optimization of educational management strategies involve a number of aspects, including educational objectives, resource allocation, human resource management, and educational and teaching reform. Educational management strategies should be flexible in order to adapt to the ever-changing educational environment. Meanwhile, human resources, financial management, and quality of education and teaching are the core elements of education management. In formulating education management strategies, the principles of goal orientation, pragmatism, system optimization, and continuous improvement should be followed. The formulation process includes the stages of clarifying objectives, analyzing the current situation, formulating programs, demonstrating and evaluating, implementing programs, monitoring and feedback, and continuous improvement. In the formulation process, methods such as literature research, survey research, case studies, brainstorming, and system analysis can be used. In the process of implementing educational management strategies, attention should be paid to clear responsibilities, training and guidance, supervision and inspection, and motivation and evaluation. In addition, educational managers need to pay attention to the implementation of strategic planning to ensure the successful realization of strategic goals through effective organization, coordination, communication, and motivation. In conclusion, the formulation, implementation, evaluation, and optimization of educational management strategies are the keys to improving educational management. Educational administrators need to thoroughly consider internal and external factors and take into account the actual situation to formulate and implement effective educational management strategies in order to improve the quality of education and teaching and promote the overall development of students. At the same time, educational administrators need to pay attention to the implementation of strategic planning to ensure the financial health of educational organizations and the achievement of educational and teaching goals.

Methods of Developing a Strategy

Francis j. Aguilar (1967) introduced the PEST model in his book Scanning the Business Environment, and he was one of the early proponents of PEST analysis. Ian Wilson (1974) further developed PEST analysis in his book The Business Environment. Andrzej Zielinski (1983) discussed the concept of PESTEL (Political, Economic, Social, Technological, Legal, Environmental) in detail in his published article using PEST analysis as part of assessing external environmental factors.

Andrews (1971), in "The Concept of Business Strategy," proposed the SWOT analysis, which includes strengths, opportunities, weaknesses, and threats. A method of synthesizing and summarizing all aspects of the internal and external conditions of a business and then analyzing the strengths, weaknesses, opportunities, and threats facing the organization.

Steps in Strategy Formulation

Strategy formation is the process by which an organization or an individual develops plans and methods to achieve specific goals (John A. Pierce II et al., 2005). The following are the general steps of strategy formation:

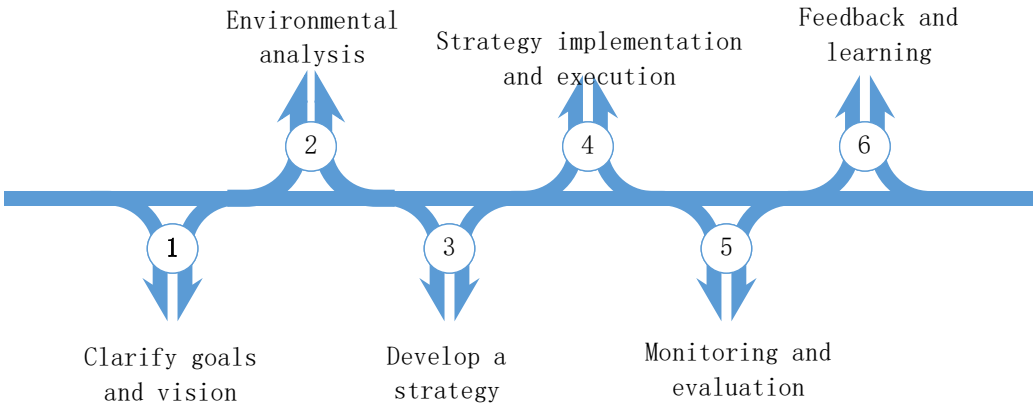

Figure 2.1 Steps in Strategy Development

1) Clarify goals and vision: Identify the long-term and short-term goals that the organization or individual wants to achieve and define the desired vision or state in the future.

2) Environmental analysis: a comprehensive analysis of the external environment and external resources. External environmental analysis involves understanding market, competitive, regulatory, and technological trends. The internal analysis consists of the organization's resources, capabilities, culture, and structure.

3) Strategy development: Based on the results of the analysis, the strategic direction of the organization or individual is determined. This may include choosing a market position, product or service mix, competitive strategy, etc. Based on the determination of the strategic direction, specific battle strategies and plans are developed, including resource allocation, action plans, and timetables.

4) Implementation and execution of strategy: translating the developed strategy into practical action. This may involve changes within the organization, resource allocation, and external cooperation.

5) Monitoring and Evaluation: Regularly monitor the progress of strategy implementation and evaluate its effectiveness. If necessary, adjustments and revisions should be made to adapt to the changing environment.

6) Feedback and Learning: Obtain feedback from implementation and evaluation and use it for learning. This helps to continuously improve the strategy and increase the adaptability of the organization or individual.

In summary, strategies are formed with flexibility to adapt to changing external and internal conditions and usually include clear goals and vision, environmental analysis, strategy development, implementation and execution, monitoring and evaluation, feedback and learning, and other steps.

Relevant Research

At present, there are fewer relevant studies in the academic community on educational and management strategies dedicated to enhancing the sustainable learning ability of students in higher vocational colleges and universities in Guangdong Province. Most of the scholars focus on their specialties, work in colleges and universities, and so on, to study the strategies for cultivating students' sustainable learning ability, as detailed below:

Xu Jianzhong (2006) explored the sustainable development of the higher vocational personnel training concept, put forward the higher vocational institutions should be ideological and psychological, the implementation of vocational ethics education and mental health education; in the learning, focus on the teaching of learning strategies and methods, establish the concept of lifelong learning of higher vocational students; in the ability to cultivate the higher vocational students to the core of the ability to innovate a variety of Abilitys; in the development of the higher vocational students to create a good environment and development for the continued education and development of the higher vocational students. And development to create a favorable environment and conditions.

Yang Wisdom (2014) discussed the critical theoretical and practical significance of sustainable learning ability cultivation throughout the teaching of higher vocational accounting professional courses from the perspective of the accounting profession. He believes that the reconstruction of the curriculum system of higher vocational accounting majors based on the cultivation of sustainable competence should be based on the evaluation of the existing learning competence of accounting majors. The index system of

sustainable learning competence should be identified as three levels: basic learning competence, professional continuous learning competence, and innovative learning competence. The specific program of classroom implementation should be determined.

Hu Huiping and Chen Chuanhai(2014) believe that promoting sustainable development of higher vocational students is an essential content of current higher vocational education. Higher vocational culture construction plays a positive role in cultivating high-quality skilled personnel. Actively construct and implement the "5C" model of higher vocational cultural education, namely, confidence cultivation, ability-oriented, creative education, continuous learning, and career planning, to develop the wisdom and talent of higher vocational students so as to promote the comprehensive development of higher vocational students' ability and spirit.

Hao Suzhen (2017), from the perspective of higher vocational English students, believes that emphasizing the cultivation of students' independent learning ability is of great significance in improving the independent learning and continuous development ability of higher vocational students and deepening the reform of higher vocational English teaching. English teachers in higher vocational colleges and universities should take active measures to cultivate students' independent learning ability in English according to the characteristics of English learning of higher vocational students, starting from the aspects of learning motivation, learning objectives, learning atmosphere, and teaching methods.

Sun Lina and Li Wei (2020) believe that vocational education should pay attention to the cultivation of students' independent learning abilities so that students can have sustainable development. They analyzed the factors affecting the independent learning ability of higher vocational students. They explored the countermeasures to cultivate students' independent learning ability so that students can effectively face the challenges of school learning and future careers on the basis of improving their independent learning ability and then realizing comprehensive and sustainable development.

Wang Lili, Wang Xiao(2024) suggested that the cultivation of independent learning ability is the need of students' inner development, the need to break through the shortcomings of traditional teaching, and the inevitable trend of the development of the times. Under the wave of new curriculum reform, the cultivation of students' independent learning ability should start from the following three points: combining the learning situation, designing the steps of self-learning in an orderly manner; problem-driven, stimulating the motivation of independent learning; and timely reflection, improving the ability of independent learning.

Li Li and Liu Jian (2023) suggested that the rapid development of information technology and the change in social needs have put forward new requirements for higher vocational education to cultivate students' independent learning abilities. Taking Jinken Vocational and Technical College as an example, they analyzed the current situation of students' independent learning ability in higher vocational colleges and universities, explored the practical experience and strategy of cultivating students' independent learning ability based on the network platform, and pointed out that the ways to enhance students' independent learning ability in higher vocational colleges and universities to update and optimize the curriculum system, update and optimize the medium of teaching, optimize the planning and evaluation of independent learning, and optimize the teaching assessment and evaluation mechanism to start with.

In summary, academics at home and abroad have studied the issue of educational management strategies for enhancing the sustainable learning ability of students in higher vocational colleges and universities from different perspectives and with other contents. Although the experts and scholars have chosen different perspectives and ways, they have affirmed the necessity of enhancing the sustainable learning ability of students in higher vocational colleges and universities. They believe that they should make efforts to improve the sustainable learning ability of students from multiple perspectives and in various ways, improve the comprehensive quality of students, and cultivate professional and technical talents to meet social needs and serve economic and social development.

Chapter 3
Research Methods

To study the educational management strategies for strengthening the sustainable learning ability of students in higher vocational colleges and universities.

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

1. To examine the current and expected situation of students' sustainable learning ability in higher vocational colleges in Guangdong Province.

2. To develop educational management strategies to improve the students' sustainable learning ability in higher vocational colleges in Guangdong Province.

3. To evaluate the adaptability and feasibility of educational management strategies to improve the students' sustainable learning ability in higher vocational colleges in Guangdong Province.

To solve the problems mentioned in Chapter 1 and achieve the above research objectives, the researchers adopted the following research procedures, as follows:

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

Research Methods and Stage

This study utilized literature analysis and a questionnaire to collect data. The literature analysis method was employed to examine relevant studies on talent cultivation and the sustainable learning ability of students in higher vocational colleges and universities, both domestically and internationally. The study explores the current and expected situations of students' sustainable learning ability in higher vocational colleges and universities, develops educational management strategies to enhance their sustainable learning ability, and evaluates the feasibility of these strategies. The stages of this study are as follows:

Stage 1: Examine the current and expected situation of students' sustainable learning ability in higher vocational colleges in Guangdong Province.

Stage 2: Develop educational management strategies to improve students' sustainable learning ability in higher vocational colleges in Guangdong Province.

Stage 3: Evaluate the adaptability and feasibility of the educational management strategies to improve students' sustainable learning ability in higher vocational colleges in Guangdong Province.

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

Stage 1: Examine the current and expected situation of students' sustainable learning ability in higher vocational colleges in Guangdong Province

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

Step 2 In-depth Interviews

Step 3 Examine the current and expected situations of students' sustainable learning ability using a questionnaire

The details are as follows:

Step 1 Document Review

The researcher identified key topics related to sustainable learning ability and educational management strategies in higher vocational colleges.

1. Resources

Resources consisted of literature and studies related to sustainable learning ability and educational management strategies in higher vocational colleges. The sample included peer-reviewed academic journals, books, dissertations, conference proceedings, government reports, and policy documents selected based on relevance and credibility.

2. Research Instruments

2.1 Academic Databases: Google Scholar, Scopus, CNKI. (China National Knowledge Infrastructure)

2.2 Reference Management Software: EndNote, Zotero.

2.3 Analysis Tools: Content frameworks and SWOT analysis for identifying key factors and trends.

3. Data Collection

3.1 Literature Review**:** Systematic review of documents to understand existing knowledge.

3.2 Search and Retrieval: Focused searches in academic databases.

3.3 Screening and Categorization**:** Studies were screened and organized into themes such as talent cultivation, school environment, teachers, and students.

4. Data Analysis

4.1 Content Analysis**:** Identification of trends and themes from selected studies.

4.2 Thematic Analysis: Grouping data into categories based on influencing factors.

4.3 Synthesis of Findings: Integration of results to develop educational management strategies.

4.4 SWOT Analysis**:** Examination of strengths, weaknesses, opportunities, and threats concerning sustainable learning ability.

Step 2 In-depth Interviews

1. Interviewee

In this study, 8 people from four higher education institutions were selected. The full-time teachers and teaching administrators had to fulfill the following requirements: 1) they had worked in the school for more than five years; 2) they were familiar with the specifics of the school's development plan, teaching management, and student development, 3) must be willing to participate in the recorded structured interviews; 4) must be willing to review their interview transcripts for validation.

Table 3.1 List of Interviewees

NO	Education Institutions	Interviewee	Reason
1	Shenzhen Vocational and Technical College	2	The best vocational colleges in the PRE
2	Shanwei Vocational and Technical College	2	The best vocational colleges in the EGD
3	Maoming Vocational and Technical College	2	The best vocational colleges in the WGD
4	Heyuan Vocational and Technical College	2	The best vocational colleges in the NGD
	Total	8	

PRE: The Pearl River Delta is located in the south-central part of Guangdong Province, China, and includes nine cities, including Guangzhou, Shenzhen, and Dongguan.

EGD: East Guangdong, located in the eastern part of Guangdong Province, China, includes five cities: Shantou, Chaozhou, Jieyang, Shanwei, and Huizhou

WGD: West Guangdong, located in the western part of Guangdong Province, China, includes four cities: Zhanjiang, Maoming, Yangjiang, and Yunfu

NGD: North Guangdong, located in the northern part of Guangdong Province, China, includes four cities: Shaoguan, Qingyuan, Meizhou, and Heyuan

2. Research Instrument

The interview form, designed based on the research framework, comprised:

Part 1: Basic Information or Demographics of Respondents consists of:

1. Name (Interviewee)
2. Position
3. Work Unit
4. Interview Date
5. Interview Duration

Part 2: Key Topics - Perspectives on Factors Influencing Sustainable Learning Ability

The main points of the interview included not only providing advice on strategy development but also addressing questions regarding the strengths, weaknesses, opportunities, and threats (SWOT) of each factor: the school environment/ teachers/ and students./ The researcher analyzed the interview results based on the SWOT of each factor to guide the creation of a questionnaire aimed at studying the current and expected situations of students' sustainable learning ability.

Part 3: Additional Suggestions - Open-Ended Questions for Further Recommendations

The interview form was reviewed and validated by the dissertation chair and advisory committee to ensure its accuracy and completeness.

3. Data collection

3.1 The researcher requested a letter from the Graduate School of Bansomdejchaopraya Rajabhat University to send a letter to collect interview data from 8 teachers and educational administrators from 4 higher vocational institutions in Guangdong Province.

3.2 The researcher sent invitation letters to the interviewees who participated in proposing strategies.

3.3 The researcher conducted interviews with 8 participants, each lasting no less than 30 minutes. In June 2024

3.4 The researcher conducted face-to-face interviews with the eight teachers and educational administrators to ensure that 100% of the eight interview forms were returned.

4. Data analysis

4.1 Analysis of Respondents' Personal Information

The personal details of the respondents, including gender, age, educational background, and profession, were analyzed using frequency and percentage to provide a demographic overview.

4.2 Analysis of Interview Data

Content analysis methods were employed to systematically categorize and interpret the interview data. Effective information was extracted, summarized, and linked to prior studies to ensure consistency and relevance.

Based on the analysis, strategies and actionable measures were proposed to enhance students' sustainable learning ability in higher vocational colleges.

4.3 Integration of Results

The findings from interviews was synthesized to ensure a comprehensive understanding of the issue.

Step 3 Examine the current and expected situations of students' sustainable learning ability using a questionnaire

1. The Population/Sample group

Population

Guangdong Province currently has 93 higher vocational colleges with 1.254 million students and about 50,000 educational administrators and teachers. This study will select teachers and students from four representative higher vocational colleges based on regional conditions as the research subjects, namely 33,475 students in the Pearl River Delta (PRD), 9,786 students in Eastern Guangdong (EGD), 17,599 students in Western Guangdong (WGD) and 17,664 students in Northern Guangdong (NGD). The informants are the best schools among the higher vocational colleges in PRD, EGD, WGD, and NGD, namely

Shenzhen Vocational and Technical College, Shanwei Vocational and Technical College, Maoming Vocational and Technical College and Heyuan Vocational and Technical College.

Sample group

Collecting the sample of questionnaires

According to the sampling table of Krejcie R.V. and Morgan D.W. (1970), the sample group of this study will adopt the purposive sampling method and select the best schools from the higher vocational colleges in the four regions of PRD, EGD, WGD, and NGD for questionnaire survey. A total of 384 students were sampled, who are more representative in terms of students' sustainable learning ability. To ensure the representativeness of the sample group, this study will strive to ensure that the sample group reflects the characteristics of the entire population in terms of gender, age, grade, etc. In the selection of the sample group, this study will follow scientific sampling principles such as randomness and representativeness to ensure the validity and credibility of the research results. At the same time, this study will respect the rights and privacy of each participant to ensure the ethics of the research.

Table 3.2 Sample size table of this survey

NO	Education Institutions	Population	Sample Group	Reason
1	Shenzhen Vocational and Technical College	33,475	164	The best vocational colleges in the PRE
2	Shanwei Vocational and Technical College	9,786	48	The best vocational colleges in the EGD
3	Maoming Vocational and Technical College	17,599	86	The best vocational colleges in the WGD
4	Heyuan Vocational and Technical College	17,664	86	The best vocational colleges in the NGD
	Total	78,542	384	

According to Table 3.2 This ensures a final sample size of 384 participants, The sampling method follows the Multi-stage Random Sampling principle with the following steps:

1. Purposive Sampling: Selecting the best school from each region, with one school per region, totaling four schools out of 93. This process results in a sample of 384 students.

2. Proportional Stratified Random Sampling: Sampling based on the proportional stratification of each region and calculating the proportion using Probability Proportional to Size (PPS) according to the population size of each region.

3. Volunteer Sampling: Recruiting participants who meet predefined representative criteria and then selecting the final sample through Simple Random Sampling using a lottery method. This ensures a final sample size of 384 participants

2. Research instrument

Questionnaire Survey

Designing the questionnaire

Part I: The questionnaire, validity, and feasibility were prepared by five education experts. Respondents' information, including gender, age, educational background, and profession.

Part 2: This study focuses on the questionnaire survey on the current and expected situations regarding sustainable learning ability in higher education institutions, including learning goals, learning process, learning effect, and learning satisfaction. The data interpretation criteria based on the Likert five-point scale are as follows:

5 indicates that the level of the current/expected situations of students' sustainable learning ability in higher vocational colleges and universities is at the highest level.

4 indicates that the level of the current/expected situations of students' sustainable learning ability in higher vocational colleges and universities is at a high level.

3 indicates that the level of the current/expected situations of students' sustainable learning ability in higher vocational colleges and universities is at a moderate level.

2 indicates that the level of the current/expected situations of students' sustainable learning ability in higher vocational institutions is at a low level.

1 indicates that the level of the current/expected situations of students' sustainable learning ability in higher vocational institutions is at the lowest level

The process of constructing a questionnaire

The process of constructing a questionnaire is as follows:

1. Reviewing and analyzing the literature, concepts, theories, and studies related to the sustainable learning ability of students in higher education institutions.

2. Construct a questionnaire on the current status of students' sustainable learning ability in higher education institutions. The outline of the questionnaire was then sent to the thesis advisor to review and revise the content based on the suggestions.

3. The index of goal congruence (IOC) (Brian Foote, 1988) of the questionnaire was checked by three experts.

If the calculated consistency index is greater than or equal to 0.50, it indicates that the questionnaire is consistent and applicable. The evaluation of the questionnaire by experts revealed a consistency index ranging between 0.60 and 1.00.

4. The questionnaire was revised based on the experts' suggestions.

5. The questionnaire was piloted with a sample group of 20 students from higher education institutions who were not part of the actual sample group. The researcher used purposive sampling for this trial to determine the discrimination power and reliability of the questionnaire.

The results showed that the questionnaire had a discrimination power ranging from 0.42 to 0.89 and a reliability coefficient of 0.88. The researcher revised and improved the questionnaire, obtained approval from the academic advisor, and finalized it for use in data collection.

3. Data collection

The method of data collection for Aim 1: To examine the issue of the current and expected situation of students' sustainable learning ability in higher education institutions, the steps are as follows:

1. The researcher requested a letter from the Graduate School of Bansomdejchaopraya Rajabhat University requiring data from 384 students from four higher vocational colleges in Guangdong Province.

2. The researcher personally coordinated with four higher vocational colleges in Guangdong Province to request assistance in distributing and collecting the questionnaires. The researcher first made a phone call to request cooperation, followed by mailing the questionnaires. The sampling method used Volunteer Sampling, requesting voluntary participation in the questionnaire from a sample group that meets the predefined criteria. To facilitate the return process, self-addressed, stamped envelopes were included. Additionally, the questionnaires were distributed via electronic mail (E-Mail) and the E-Office system.

3. The researcher followed up on the responses to the questionnaires, both by mail and online, with the sample group. Follow-up phone calls were made in cases of

delayed responses or to confirm that the questionnaires had been received by the intended participants. A total of 384 completed questionnaires were returned, achieving a 100% response rate.

4. Data analysis

The researcher analyzed the returned questionnaires as follows:

Part 1: Analysis of Respondents' Basic Information

The basic information of the respondents was analyzed using descriptive statistics to present frequency and percentage distributions.

Part 2: Analysis of the Current and Expected Situations of Students' Sustainable Learning Ability in Higher Vocational Colleges in Guangdong Province

A software package was utilized to summarize and analyze the results statistically. The analysis involved calculating the mean and standard deviation (S.D.) to assess the overall trends. Additionally, the $PNI_{modified}$ (Priority Need Index) was applied to determine the significance of the needs, using the formula adapted by Suwimon Wongwanich (Wongwanich, 2005, p. 279).

The mean data based on Rensis Likert (1932) is interpreted as follows:

4.50 - 5.00 Represents the current/expected situation at the highest level.

3.50 - 4.49 Represents the current/expected situation at a high level.

2.50 - 3.49 Represents the current/expected situation at a moderate level.

1.50 - 2.49 Represents the current/expected situation at a low level.

1.00 - 1.49 Represents the current/expected situation at the lowest level.

This process provided a comprehensive understanding of both the current and expected situations regarding students' sustainable learning ability.

Stage 2: Develop educational management strategies to improve the students' sustainable learning ability in higher vocational colleges in Guangdong Province

The research process is divided into three main steps:

Step 1 Analysis of Needs, Strengths, Weaknesses, Opportunities, and Threats for developing students' sustainable learning ability in higher vocational colleges in Guangdong Province.

Step 2 Drafting the Development of Strategies for Improving Students' Sustainable Learning Ability in Higher Vocational Colleges in Guangdong Province using the SWOT/TOWS Matrix Technique

Step 3 Develop educational management strategies to improve students' sustainable learning ability in higher vocational colleges in Guangdong Province.

The details are as follows:

Step 1: Analysis of Needs, Strengths, Weaknesses, Opportunities, and Threats for Developing Students' Sustainable Learning Ability in higher vocational colleges in Guangdong Province.

Based on the study results from Stage 1, The researcher analyzed the needs, strengths, weaknesses, opportunities, and threats related to developing educational management strategies for improving students' sustainable learning ability in Higher Vocational Colleges in Guangdong Province**.** This was done by analyzing data collected through questionnaires, with the following steps:

1. Needs Analysis Using the Modified Priority Needs Index ($PNI_{Modified}$):

1.1 The priority needs for developing students' sustainable learning ability were ranked using the Modified Priority Needs Index ($PNI_{Modified}$) method.

1.2 The calculation formula used is as follows (Nonglak Wiratchai & Suwimon Wongwanich, 2005, p. 279):

$PNI_{Modified} = I - D/D$

PNI Represents the priority needs index.

I Represents the average score of the expected situations of students' sustainable learning ability.

D Represents the average score of the current situations of students' sustainable learning ability.

2. Ranking Priority Needs:

Needs were ranked from the highest to the lowest $PNI_{Modified}$ values.

High $PNI_{Modified}$ values indicate weaknesses (W) that require strategies to address and improve.

Low or equal PNIModified values indicate strengths (S) that require strategies to reinforce and sustain.

3. **Synthesizing Strengths, Weaknesses, Opportunities, and Threats:**

The researcher synthesized the strengths and weaknesses from the $PNI_{Modified}$ values.

Synthesized the opportunities and threats: Opinions from interviews conducted in Stage 1 were analyzed to identify opportunities and threats, forming the basis for

defining key strategies and operational methods for developing students' sustainable learning ability.

4. Determining Strategic Directions:

The $PNI_{Modified}$ values were compared with the average $PNI_{Modified}$ score across all aspects:

Strengths (S): If the $PNI_{Modified}$ value is less than or equal to the average, it indicates a strength.

Weaknesses (W): If the $PNI_{Modified}$ value is higher than the average, it indicates a weakness.

The results were used to identify strategic directions, emphasizing reducing weaknesses and reinforcing strengths.

Outcome of Analysis:

The researcher ranked the overall priority needs and categorized them by aspect. If a $PNI_{Modified}$ value exceeded the average, the identified need was included in the strategy development plan. Conversely, strengths with lower $PNI_{Modified}$ values were used to create strategies that enhanced these positive attributes.

The findings from this analysis were synthesized into actionable data to inform the development of strategies for improving students' sustainable learning ability in higher vocational colleges in Guangdong Province**.**

Step 2 Drafting the Development of Strategies for Improving Students' Sustainable Learning Ability in Higher Vocational Colleges in Guangdong Province using the SWOT/TOWS Matrix Technique

This step involves conducting a SWOT analysis based on the results of the Ranking Priority Needs analysis from Step 1 to evaluate the strengths, weaknesses, opportunities, and threats (SWOT) related to developing students' sustainable learning ability in higher vocational colleges in Guangdong Province. The analysis follows the TOWS Matrix approach as follows:

1. Matching Strengths and Opportunities (SO):

Develop proactive strategies to leverage existing strengths to take advantage of external opportunities.

2. Matching Strengths and Threats (ST):

Formulate defensive strategies or expand operations to utilize existing strengths to mitigate potential threats, ensuring long-term benefits.

3. Matching Weaknesses and Opportunities (WO):

Design corrective strategies to address internal weaknesses and prepare to capitalize on favorable external opportunities.

4. Matching Weaknesses and Threats (WT):

Develop reactive strategies to minimize potential threats or obstacles and implement measures to reduce waste and inefficiency.

Strategy Drafting

The results of the SWOT and TOWS analysis were used to draft strategies for improving students' sustainable learning ability in higher vocational colleges in Guangdong Province. The drafted strategies include:

12 Strategies: Core approaches to address major needs.

16 proposed projects to support the strategies. Supportive measures to complement the primary strategies.

Operational Methods: Practical steps for implementation.

Validation of Draft Strategies

The drafted strategies were reviewed and submitted to the thesis committee chairperson and advisors for further evaluation and feedback to ensure their suitability and effectiveness.

Step 3 Develop educational management strategies to improve students' sustainable learning ability in higher vocational colleges in Guangdong Province.

1. Target Group

Purposive sampling was used in developing strategies for improving students' sustainable learning in higher education institutions. The full-time teachers and teaching administrators had to fulfill the following requirements:

1) they had worked in the school for more than five years

2) they were familiar with the specifics of the school's development plan, teaching management, and student development and

12 experts from four higher education institutions, who have great influence on strategy formulation, sustainable development, students' learning ability, talent cultivation and education management of higher vocational institutions. The qualifications of the experts: 1) more than 15 years of work, 2) senior titles, and3) senior leaders.

The list of all 12 experts is shown in the appendix on page 182 - 183

Table 3.3 List of Focus Group Interviewees

NO	Education Institutions	Focus group Interviewee	Reason
1	Shenzhen Vocational and Technical College	3	The best vocational colleges in the PRE
2	Shanwei Vocational and Technical College	3	The best vocational colleges in the EGD
3	Maoming Vocational and Technical College	3	The best vocational colleges in the WGD
4	Heyuan Vocational and Technical College	3	The best vocational colleges in the NGD
	Total	12	

2. Research instrument

Focus Group Interview Form

Based on the results of the questionnaire survey and analysis of the current situation of students' sustainable learning ability in higher vocational colleges and universities, a corresponding structured focus group interview form was developed from three aspects: School environment factors, teacher factors, and school factors.

3. Data collection

The method of data collection for Aim 2: To provide strategies to improve the sustainable learning ability of students in higher vocational colleges and universities, the steps are as follows:

3.1 The results from the first stage are used to develop the educational management strategies prototype to improve the students' sustainable learning ability in higher vocational colleges in Guangdong Province

3.2 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. (4 teachers, 4 educational administrators, and 4 experts from 4 higher vocational institutions in Guangdong Province.)

3.3 Conducting the Focus Group Discussion:

The Focus Group Interviewees is scheduled to be held on November 11, 2024, from 9:00 AM to 4:00 PM at the China Health School Conference Room, Heyuan City, Guangdong Province, China.

Before the discussion, the researcher explained the background and significance of the study, the research process, and presented the draft Educational management strategies for improving students' sustainable learning ability in Higher Vocational Colleges in Guangdong Province.

The discussion involved expert critiques on key components of the draft strategies, including vision, mission, objectives, strategies, operational methods, and indicators.

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.

3.4 Summarizing Discussion Outcomes

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

3.5 Revising the Strategies

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

4. **Data Analysis**

The researcher conducted data analysis using content analysis. Suggestions from experts were considered to reach a consensus and were used to revise the draft of the Educational Management Strategies for Improving Students' Sustainable Learning Ability in Higher Vocational Colleges in Guangdong Province**.**

Stage 3: Evaluate the adaptability and feasibility of the educational management strategies to improve students' sustainable learning ability in higher vocational colleges in Guangdong Province.

1. Target group

The five experts for assessing the integration strategy of sustainable learning ability are from Shenzhen Institute of Vocational Technology and Heyuan Institute of Vocational Technology, who have great influence on strategy formulation, sustainable development, students' learning ability, talent cultivation, and education management of higher vocational institutions. The qualifications of the experts: 1) more than 15 years of work, 2) senior titles, and 3) senior leaders. The evaluation form was based on a five-point Likert scale with four levels of evaluation: "very high", "high", " moderate ", "low" and "very low".

Table 3.4 List of experts in the evaluation team

NO	Education Institutions	Assessment Panel experts
1	Bansomdejchaopraya Rajabhat University	3
2	Heyuan Vocational and Technical College	2
	Total	5

2. Research instrument

2.1 Evaluation form

This instrument collects data for Objective 3 and evaluates the suitability and feasibility of educational management strategies to improve students' sustainable learning ability in higher vocational institutions. Five experts from Shenzhen Vocational and Technical University and Heyuan Vocational and Technical College were invited to evaluate the suitability and feasibility of the strategy. 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 educational management strategies to improve students' sustainable learning ability in higher vocational institutions 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 suitability and feasibility of the strategies at the highest level

4 refers to the suitability and feasibility of the strategies at a high level

3 refers to the suitability and feasibility of the strategies at a moderate level

2 refers to the suitability and feasibility of the strategies at a low level

1 refers to the suitability and feasibility of the strategies at the lowest level

2.2 The process of constructing a evaluation form

2.2.1 The researcher used the details of the Educational Management Strategies for Improving Students' Sustainable Learning Ability in Higher Vocational Colleges in Guangdong Province as the basis for formulating the questions.

2.2.2 The researcher developed a questionnaire to evaluate the appropriateness and feasibility of the Educational Management Strategies for Improving Students' Sustainable Learning Ability in Higher Vocational Colleges in Guangdong Province

using a 5-point rating scale.

2.2.3 The researcher submitted the draft questionnaire for assessing the appropriateness and feasibility of the strategies to the thesis advisor and committee chair for review, focusing on appropriateness and language usage.

2.2.4 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

The method of data collection for Aim 3: To evaluate the suitability and feasibility of educational management strategies to improve the students' sustainable learning ability in higher vocational colleges in Guangdong Province

The results from the second stage are used to evaluate the educational management strategies to improve the students' sustainable learning ability in higher vocational colleges in Guangdong Province. The steps are as follows:

3.1 The researcher requested a letter from the Graduate School of Bansomdejchaopraya Rajabhat University to collect evaluations from five experts from Shenzhen University of Vocational Technology and Heyuan Institute of Vocational Technology to formulate the educational management strategy for improving sustainable learning competence.

3.2 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, and ensured that the evaluation forms were collected 100%.

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

3.4 The researcher summarized and analyzed the results of the evaluation form.

4. Data analysis

The researcher analyzed the data collected from the questionnaire designed to evaluate the appropriateness and feasibility of the Educational Management Strategies for Improving Students' Sustainable Learning Ability in Higher Vocational Colleges in Guangdong Province in two parts as follows:

Part 1: Basic information about the respondents. The data was analyzed using frequency and percentage.

Part 2: Opinions on the appropriateness and feasibility of the Educational Management Strategies for Improving Students' Sustainable Learning Ability in Higher Vocational Colleges in Guangdong Province. The data was analyzed using statistical software. The statistical methods used included mean and standard deviation.

The data interpretation for average value is based on Rensis Likert (1932). The data interpretation is as follows:

4.50 - 5.00 expresses the highest level

3.50 - 4.49 expresses high level

2.50 - 3.49 expression moderate level

1.50 - 2.49 expresses low level

1.00 - 1.49 expresses the lowest level

Strategies with an average score of 3.510 or higher indicate appropriateness and feasibility.

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

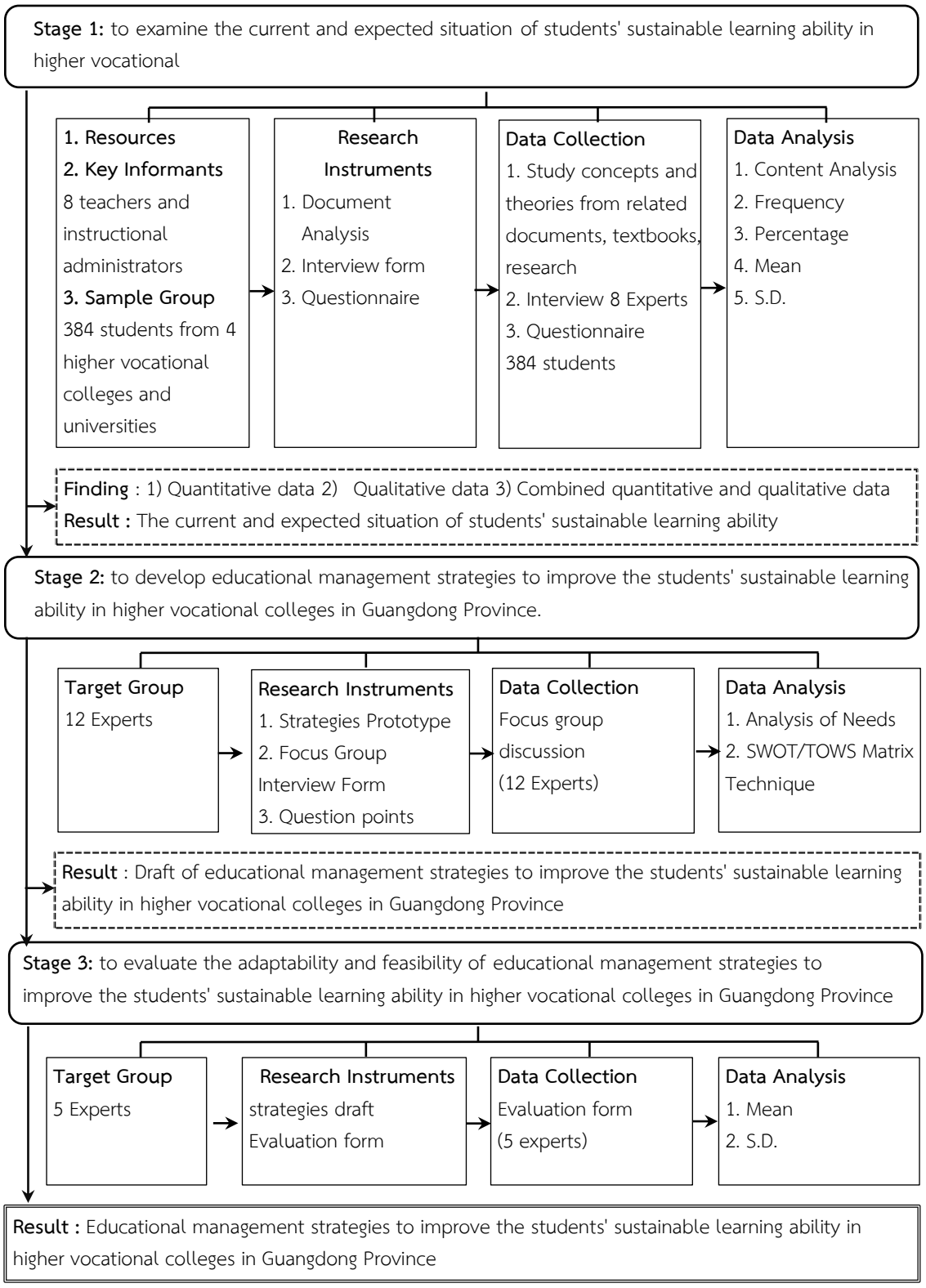

Figure 3.1 Research method

Chapter 4
Results of Analysis

The presentation of research data analysis on Educational Management Strategies for Improving Students' Sustainable Learning Ability in Higher Vocational Colleges in Guangdong Province is organized as follows:

1. Symbol and Abbreviations
2. Results of data analysis

Symbol and Abbreviations

To ensure a clear understanding of the interpretation of the data analysis, the researcher has defined the meanings of the symbols used in the analysis as follows:

n	refers to the sample group
$\overline{X}$	refers to the average value
S.D.	refers to the standard deviation
$\mathbf{PNI_{Modified}}$	refers to the Modified Priority Needs Index
I	refers to the expected condition of students' sustainable learning ability
D	refers to the current condition of students' sustainable learning ability
S	refers to Internal environments that serve as strengths for students' sustainable learning ability
W	refers to internal environments that act as weaknesses in students' sustainable learning ability
O	refers to External environments that provide opportunities for students' sustainable learning ability
T	refers to External environments that pose threats or challenges to students' sustainable learning ability

Results of data analysis

The presentation of the research data analysis on Educational Management Strategies for Improving Students' Sustainable Learning Ability in Higher Vocational Colleges in Guangdong Province is divided into three phases, detailed as follows:

Stage 1: Results of the current and expected situations of students' sustainable learning ability in Higher Vocational Colleges in Guangdong Province

This stage consists of three steps as follows:

Step 1 Document Review

Step 2 In-depth Interviews

Step 3 Examine the current and expected situations of students' sustainable learning ability using a questionnaire.

Stage 2: Results of the development of educational management strategies to improve students' sustainable learning ability in higher vocational colleges in Guangdong Province. This stage consists of four steps as follows:

Step 1 Analysis of Needs, Strengths, Weaknesses, Opportunities, and Threats for developing students' sustainable learning ability in higher vocational colleges in Guangdong Province.

Step 2 Drafting the Development of Strategies for Improving Students' Sustainable Learning Ability in Higher Vocational Colleges in Guangdong Province using the SWOT/TOWS Matrix Technique

Step 3 Develop educational management strategies to improve students' sustainable learning ability in higher vocational colleges in Guangdong Province..

Stage 3: Evaluation of the adaptability and feasibility of the educational management strategies to improve students' sustainable learning ability in higher vocational colleges in Guangdong Province.

Details of the data analysis results are as follows.

Stage 1: Results of the current and expected situations of students' sustainable Learning ability in higher vocational colleges in Guangdong Province.

Study the current and expected situation of students' sustainable learning ability in higher vocational colleges in Guangdong Province. Involves conducting research in three sub-steps as follows:

Step 1 Document Review: The researcher conducted a comprehensive review of documents, publications, electronic media, and research studies to analyze the current and desired states of students' sustainable learning ability in higher vocational colleges in Guangdong Province. Content analysis was used to extract key insights.

The study found three key components of students' sustainable learning ability in higher vocational colleges in Guangdong Province: school environment, teacher, and student factors. The results of the study are shown in Table 4.1.

Table 4.1 The key components of students' sustainable learning ability in higher vocational colleges in Guangdong Province:

Key Component	Description	Resources
School Environment	The institutional context, including infrastructure, resources, and curricular design, plays a crucial role in shaping sustainable learning abilities. A supportive school environment fosters continuous learning.	Baiyang, L. (2023). Educational management strategies development for improving students' sustainable learning ability in higher vocational colleges in Guangdong Province. *International Journal of Education & Literacy Studies*, 11(1), 1-10. https://doi.org/10.7575/aiac.ijels.v.11n.1p.1 Earth.org. (2023). *The importance of environmental education for a sustainable future*. Retrieved from www.earth.orgLiu, Y., Zhang, L., & Wang, X. (2018). Enhancing students' key competencies for sustainable development in vocational education. *TVET@Asia*, 14, 1-15. https://tvet-online.asia/14/liu-etal/ Sinakou, E., Donche, V., Boeve-de Pauw, J., & Van Petegem, P. (2019). Designing powerful learning environments in education for sustainable development: A conceptual framework. *Environmental Education Research, 25*(5), 671-691. https://doi.org/10.1080/13504622.2019.1572072 Sinakou, E., Donche, V., Boeve-de Pauw, J., & Van Petegem, P. (2019). Designing learning environments for education for sustainable development. *Environmental Education Research, 25*(8), 1215-1231. https://doi.org/10.1080/13504622.2018.1553236 Sinakou, E., Voulvoulis, N., & Papanikolaou, A. (2019). A sustainability integrated school environment for fostering lifelong learning. *Environmental Education Research, 25*(4), 514-

Table 4.1 (continued).

Key Component	Description	Resources
		532. U.S. Department of Education. (n.d.). *Infrastructure and sustainability*. Retrieved from www.ed.gov Zhang, H., & Li, J. (2023). A review on sustainable development of technical and vocational education and training among the students from China. *International Journal of Educational Research*, 12(2), 45-60. https://doi.org/10.11648/j.ijer.20231202.11
Teacher	Teachers' pedagogical strategies, such as active engagement, collaborative learning, and critical thinking promotion, play an essential role in fostering sustainable learning abilities	Baiyang, L. (2023). Educational management strategies development for improving students' sustainable learning ability in higher vocational colleges in Guangdong Province. *International Journal of Education & Literacy Studies*, 11(1), 1-10. https://doi.org/10.7575/aiac.ijels.v.11n.1p.1 Cebrián & Junyent (2015) Cebrián, G., & Junyent, M. (2015). Competencies in education for sustainable development: Exploring the student teachers' views. *Sustainability, 7*(3), 2768-2786. https://doi.org/10.3390/su7032768 Liu, Y., Zhang, L., & Wang, X. (2018). Enhancing students' key competencies for sustainable development in vocational education. *TVET@Asia*, 14, 1-15. https://tvet-online.asia/14/liu-etal/ Shi, P. (2018). Teacher-centered versus student-centered approaches in vocational education. *International Journal of Educational Research, 91*, 55-61. Wideman-van der Laan, Y. (2022). *Building green sustainable schools: From vision to reality*. Retrieved from www.ed-spaces.com

Table 4.1 (continued).

Key Component	Description	Resources
		Dutta, D. (2023). Aligning curriculum with sustainable infrastructure development.*Journal of Infrastructure and Planning Development, 7*(1), 1-10. Zhang, H., & Li, J. (2023). A review on sustainable development of technical and vocational education and training among the students from China. *International Journal of Educational Research*, 12(2), 45-60. https://doi.org/10.11648/j.ijer.20231202.11 Zimmerman, B. J. (2002). Becoming a self-regulated learner: An overview. *Theory into Practice, 41*(2), 64-70. https://doi.org/10.1207/s15430421tip4102_2
Student	The students' motivation, self-directed learning, and active participation in the learning process significantly influence the development of their sustainable learning abilities.	Anyolo, E. O., Kärkkäinen, S., & Keinonen, T. (2018). Implementing education for sustainable development in Namibia: School teachers' perceptions and teaching practices. *International Journal of Sustainability in Higher Education, 19*(1), 107-127. https://doi.org/10.1108/IJSHE-02-2017-0016 Baiyang, L. (2023). Educational management strategies development for improving students' sustainable learning ability in higher vocational colleges in Guangdong Province. *International Journal of Education & Literacy Studies*, 11(1), 1-10. https://doi.org/10.7575/aiac.ijels.v.11n.1p.1 Liu, Y., Zhang, L., & Wang, X. (2018). Enhancing students' key competencies for sustainable development in vocational education. *TVET@Asia*, 14, 1-15. https://tvet-online.asia/14/liu-etal/

Table 4.1 (continued).

Key Component	Description	Resources
		Pintrich, P. R. (2000). The role of goal orientation in self-regulated learning. In *Handbook of self-regulation* (pp. 451-502). Academic Press. Santos, R. (2023). Benefits of a more sustainable learning environment in schools and universities. Retrieved from www.cisco.com Project Learning Tree. (n.d.). *Top 10 benefits of environmental education*. Retrieved from www.plt.org U.S. Department of Education. (2022). *The impact of student-centered learning in schools*. *Journal of Educational Research, 68*(2), 178-195. Zhang, H., & Li, J. (2023). A review on sustainable development of technical and vocational education and training among the students from China. *International Journal of Educational Research*, 12(2), 45-60. https://doi.org/10.11648/j.ijer.20231202.11

Based on Table 4.1, This research highlights the interconnected roles of school environment, teachers, and students in fostering sustainable learning. A well-structured learning space, combined with effective teaching methodologies and active student participation, enhances students' sustainable learning ability in higher vocational colleges in Guangdong Province

Step 2 In-depth Interviews: To explore the factors influencing students' sustainable learning ability, in-depth interviews were conducted with eight purposively sampled experts, including teachers and teaching administrators from four higher education institutions. Selection criteria included: At least five years of institutional experience, Knowledge of institutional development plans, teaching management, and student development, and Willingness to participate in structured, recorded interviews.

1. The main points of the interview included not only providing advice on strategy development but also answering questions regarding the strengths, weaknesses, opportunities, and threats of each factor, namely the school environment, teachers, and students. The researcher analyzed the interview results concerning the

strengths, weaknesses, opportunities, and threats of each factor to serve as a guideline for creating a questionnaire to study the current and expected situations of students' sustainable learning ability. This analysis involved content analysis, grouping, and frequency distribution.

2. Results of the analysis of opportunities and threats to students' sustainable learning ability in higher vocational colleges in Guangdong Province

The external environmental opportunities (O) and threats (T) were analyzed to identify factors influencing students' sustainable learning ability in higher vocational colleges in Guangdong Province. This comprehensive analysis was based on expert interviews. The summarized interview results regarding the opportunities and threats to students' sustainable learning ability are presented in Table 4.1.

Table 4.2 The summarized interview results on the opportunities and threats to students' sustainable learning ability

The opportunities and threats to students' sustainable learning ability	Interviewee								
	1	2	3	4	5	6	7	8	f
Opportunities									
1. The state provides policy support for vocational education, which helps schools strengthen education management and enhance students' sustainable independent learning ability.	✓	✓	✓	✓	✓	✓		✓	7*
2. The rapid development of technology introduces innovative teaching tools and methods, enhancing interactive and personalized learning experiences for students.	✓	✓		✓			✓		4
3. State policies on communication and collaboration That affects the development of students' learning skills	✓		✓		✓				3
4. Policies promoting vocational education, such as funding, training programs, and curriculum development, provide a strong foundation for improving management strategies.		✓		✓		✓		✓	4
5. The shortage of skilled personnel in society and the broad employment	✓		✓		✓	✓	✓	✓	7*

Table 4.2 (continued).

The opportunities and threats to students' sustainable learning ability	Interviewee								
	1	2	3	4	5	6	7	8	f
prospects of students help to motivate students' sustainable independent learning ability.									
6. The high demand for skilled professionals in the labor market creates incentives for schools to improve students' practical and sustainable learning abilities to meet industry needs.	✓		✓		✓	✓			4
7. The progress of science and technology brings more new teaching equipment and teaching methods, which helps schools to cultivate students' sustainable independent learning ability.	✓		✓	✓	✓		✓	✓	6*
8. The strong economic environment supports investments in education and infrastructure, which can boost the implementation of sustainable learning strategies.	✓		✓	✓			✓		4
9. International collaborations and partnerships with industries and educational institutions open avenues for adopting best practices and improving educational quality.	✓		✓		✓	✓			4
10. The governing agency supports the development and self-improvement in building positive relationships with others.		✓		✓	✓	✓		✓	5
Threats									
1. Increasing competition in the market increases the pressure on schools to enhance students' sustainable independent learning ability.	✓		✓	✓	✓	✓	✓	✓	7*
2. Frequent changes or inconsistencies in national or regional education policies may disrupt long-term planning for sustainable learning strategies.	✓	✓		✓		✓			4

Table 4.2 (continued).

The opportunities and threats to students' sustainable learning ability	**Interviewee**								
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**f**
3. The governing agency does not provide reinforcement, encouragement, resources, or support for activities aimed at developing learning skills.	✓		✓		✓				3
4. The fast pace of technological evolution requires continuous updates to teaching materials and teacher training, posing challenges for resource-limited institutions.	✓	✓			✓			✓	4
5. Higher vocational colleges and universities are affected by the lack of Student sources affect the quality of education in schools and the sustainable independent learning ability of students.	✓	✓	✓	✓	✓		✓	✓	7*
6. A declining student population in some areas may limit the number of enrollments, reducing resources and opportunities for sustainable development.	✓		✓		✓	✓		✓	5
7. The continuous change in science and technology has put forward new challenges to the cultivation of students' sustainable independent learning ability.	✓	✓	✓		✓	✓		✓	6*
8. Variability in funding and resources between urban and rural vocational colleges can create unequal opportunities for implementing advanced management strategies.	✓		✓		✓				3
9. Higher vocational colleges face pressure to compete for student enrollment, industry partnerships, and funding, which may impact the focus on long-term learning goals.	✓		✓		✓		✓		4
10. The governing agency promotes the creation of innovations for developing	✓		✓		✓				3

Table 4.2 (continued).

The opportunities and threats to students' sustainable learning ability	Interviewee								
	1	2	3	4	5	6	7	8	f
students' learning skills, but the impact on improving the quality of education is inconsistent.									

Based on Table 4.2, the study found that interviews with experts regarding external factors influencing the opportunities and threats in developing educational management strategies to improve students' sustainable learning ability in higher vocational colleges in Guangdong Province revealed that 60% or more of the experts agreed on the following:

Opportunities:

1. The state provides policy support for vocational education, which helps schools strengthen education management and enhance students' sustainable independent learning ability. (Frequency: 7, Percentage: 87.50%)

2. The shortage of skilled personnel in society and the broad employment prospects of students help to motivate students' sustainable independent learning ability. (Frequency: 7, Percentage: 87.50%)

3. The progress of science and technology brings more new teaching equipment and teaching methods, which helps schools cultivate students' sustainable independent learning abilities. (Frequency: 6, Percentage: 75.00%)

Threats:

1. Increasing competition in the market increases the pressure on schools to enhance students' sustainable independent learning ability. (Frequency: 7, Percentage: 87.50%)

2. Higher vocational colleges and universities are affected by the lack of student sources, which affects the quality of education in schools and the sustainable independent learning ability of students. (Frequency: 7, Percentage: 87.50%)

3. The continuous change in science and technology has put forward new challenges to the cultivation of students' sustainable independent learning ability. (Frequency: 6, Percentage: 75.00%)

Step 3 Study the current and expected situations of students' sustainable learning ability using a questionnaire.

The results of studying the current and expected situations of students' sustainable learning abilities in higher vocational colleges in Guangdong Province are summarized in Table 4.3 – 4.7

1. Respondents' Demographic Information

The analysis of data on the demographic information of 384 respondents, categorized by School, Gender, and Grade, is presented in Table 4.3.

Table 4.3 Analysis of the personal information and participants.

(n=384)

Personal Information		Frequency	Percentage
1. School:	1. Shenzhen Vocational and Technical University	164	42.70
	2. Shanwei Vocational and Technical College	48	12.50
	3. Maoming Vocational and Technical College	86	22.40
	4. Heyuan Vocational and Technical College	86	22.40
	Total	384	100.00
2. Gender:	1. Male	159	41.41
	2. Female	225	58.59
	Total	384	100.00
3. Grade:	1. First year of university	148	38.54
	2. Second year of university	128	33.33
	3. Third year of university	108	28.13
	Total	**384**	**100**

The study, based on Table 4.3, found that among the 384 respondents, the largest group consisted of students from Shenzhen Vocational and Technical University (42.70%, 164 individuals), followed by those from Maoming Vocational and Technical College and Heyuan Vocational and Technical College (22.40%, 86 individuals). Most respondents were female (41.40%, 159 individuals). In terms of academic year, first-year students made up the majority (38.50%, 148 individuals), followed by second-year students (33.30%, 128 individuals) and third-year students (28.10%, 108 individuals).

2. The Current and Expected Situations of Students' Sustainable Learning Abilities in Higher Vocational Colleges in Guangdong Province

The analysis of data on the current and expected situations of students' sustainable learning ability in higher vocational colleges in Guangdong Province is detailed in Tables 4.4 to 4.6.

Table 4.4 Examination the current situation and expected situation of students' sustainable learning ability in higher vocational colleges in Guangdong

(n=384)

Students' sustainable learning ability: School environment factors	Current Situation(D)			Expected condition		
	$\overline{X}$	S.D.	Level	$\overline{X}$	S.D.	Level
1. The school should give students the initiative in learning and encourage them to ask questions, participate in discussions, and explore independently.	3.76	0.82	High	4.48	0.72	High
2. The school should design open-ended courses to guide students to acquire knowledge through independent inquiry and develop the ability to analyze and solve problems.	3.79	0.84	High	4.55	0.70	Highest
3. The school should connect learning content with real life and allow students to design and implement projects independently, reflect on their experiences, and evaluate their progress to deepen and broaden their learning.	3.83	0.92	High	4.52	0.75	highest
4. The Schools should provide a variety of learning resources and tools, such as library resources, equipment, networks, online learning platforms, field trips, etc., to meet the different learning needs and preferences of students.	3.87	0.93	High	4.54	0.74	Highest
5. The school should provide a good autonomous learning space where students can focus on their studies without interruption.	3.80	0.83	High	4.58	0.73	Highest
6. The school should integrate the concept of autonomous learning into its culture and establish relevant regulations and measures.	3.80	0.86	High	4.54	0.71	Highest

Table 4.4 (continued). (n=384)

Students' sustainable learning ability: School environment factors	Current Situation(D)			Expected condition		
	$\overline{X}$	S.D.	Level	$\overline{X}$	S.D.	Level
7. The school should encourage students to participate in school management and provide a platform for them to express their opinions.	3.77	0.93	High	4.51	0.75	Highest
8. The school should work with parents to explore ways to cultivate students' autonomous learning abilities and reach a consensus on educational philosophy and methods.	3.70	0.86	High	4.53	0.73	Highest
9. The school should guide parents to change their traditional "filling-in-the-blanks" style of education and instead encourage their children to learn independently and respect their children's learning interests and characteristics.	3.73	0.86	High	4.51	0.73	Highest
10. The school should integrate community learning resources to effectively enhance the quality of students' education.	3.63	0.85	High	4.49	0.76	High
Total	**3.77**	**0.62**	**High**	**4.53**	**0.48**	**Highest**

Analysis of the current and expected situations of students' sustainable learning ability in Higher Vocational Colleges in Guangdong Province: School environment factors

From Table 4.4, it was found that the current situation of students' sustainable learning ability (School environment) in higher vocational colleges in Guangdong Province, overall, is at a high level ($\overline{X}$ = 3.77, S.D. = 0.62). When considering each aspect individually, the most highly implemented aspect in the current situation is that the schools should provide a variety of learning resources and tools, such as library resources, equipment, networks, online learning platforms, field trips, etc., to meet the different learning needs and preferences of students. ($\overline{X}$ = 3.87, S.D. = 0.93). The second most implemented aspect is that the school should connect learning

content with real life and allow students to design and implement projects independently, reflect on their experiences, and evaluate their progress to deepen and broaden their learning. ($\overline{X}$ = 3.83, S.D. = 0.92). The least implemented aspect in the current situation is that the school should integrate community learning resources to effectively enhance the quality of students' education. ($\overline{X}$ = 3.63, S.D. = 0.85).

Regarding the expected situations of students' sustainable learning ability (School environment) in higher vocational colleges in Guangdong Province, the overall expectation is at a very high level ($\overline{X}$ = 4.53, S.D. = 0.48). When considering each aspect individually, the most highly expected aspect is that the school should provide a good autonomous learning space where students can focus on their studies without interruption. ($\overline{X}$ = 4.58, S.D. = 0.73). The second most highly expected aspect is that the school should design open-ended courses to guide students to acquire knowledge through independent inquiry and develop the ability to analyze and solve problems. ($\overline{X}$ = 4.55, S.D. = 0.70). The least highly expected aspect is that the school should give students the initiative in learning and encourage them to ask questions, participate in discussions, and explore independently. ($\overline{X}$ = 4.48, S.D. = 0.72).

Table 4.5 Examination the current situation and expected situation of students' sustainable learning ability in higher vocational colleges in Guangdong Province: Teacher factors

(n=384)

Students' sustainable learning ability: Teacher factors	**Current Situation(D)**			**Expected condition**		
	$\overline{X}$	**S.D.**	**Level**	$\overline{X}$	**S.D.**	**Level**
1. Teachers should pay attention to the thinking, exploration, cooperation, etc., in the learning process of students, not just the result.	3.70	0.90	High	4.51	0.74	Highest
2. Teachers should use a variety of evaluation methods, such as classroom performance, homework completion, project results, self-reflection, etc., to comprehensively evaluate students' learning.	3.73	0.92	High	4.53	0.75	Highest
3. Teachers should give timely feedback to students to help them understand their learning situation and make improvements based on the feedback.	3.73	0.83	High	4.53	0.75	Highest
4. Teachers should encourage students to learn, communicate, and cooperate, establish a good relationship between teachers and students, and make students feel safe, trusted, and respected.	3.76	0.86	High	4.54	0.68	Highest
5. Teachers should provide students with the opportunity to try and make mistakes, and cultivate students' creativity and exploration spirit.	3.69	0.89	High	4.55	0.72	Highest

Table 4.5 (continued).

(n=384)

Students' sustainable learning ability:	**Current Situation(D)**			**Expected condition**		
Teacher factors	$\overline{X}$	**S.D.**	**Level**	$\overline{X}$	**S.D.**	**Level**
6. What do teachers want? Organize students to participate in field trips, combine theoretical knowledge with practice, and enhance students' learning interests and understanding abilities.	3.61	0.84	High	4.47	0.74	high
7. Teachers should strengthen the study and research of independent learning theory, constantly improve teaching ability and teaching methods, and guide students to carry out independent learning.	3.70	0.82	High	4.57	0.69	Highest
8. Teachers should adopt a variety of teaching modes, such as flipped classrooms, blended teaching, etc., in order to better stimulate students' learning interest and independent learning ability.	3.54	0.85	High	4.44	0.76	High
9. Teachers should strengthen team cooperation, learn from each other, communicate and cooperate, and jointly explore and practice effective strategies for independent learning.	3.56	0.86	High	4.45	0.77	High
10. Teachers should actively learn and master new knowledge and technology, keep pace with the development of The Times, and provide students with better learning resources and guidance	3.66	0.83	High	4.50	0.74	Highest
Total	**3.67**	**0.64**	**High**	**4.51**	**0.52**	**Highest**

Analysis of the Current and Expected Situations of Students' Sustainable Learning Ability in Higher Vocational Colleges in Guangdong Province: Teacher Factors

From Table 4.5, it was found that the current situation of students' sustainable learning ability (Teacher factors) in higher vocational colleges in Guangdong Province, overall, is at a high level ($\overline{X}$ = 3.67, S.D. = 0.64). When considering each aspect individually, the most highly implemented aspect in the current situation is that teachers should encourage students to learn, communicate, and cooperate, establish a good relationship between teachers and students, and make students feel safe, trusted, and respected. ($\overline{X}$ = 3.76, S.D. = 0.86). The second most implemented aspect is that teachers should use a variety of evaluation methods, such as classroom performance, homework completion, project results, self-reflection, etc., to comprehensively evaluate students' learning. ($\overline{X}$ = 3.73, S.D. = 0.92). and Teachers should give timely feedback to students to help them understand their learning situation and make improvements based on the feedback. ($\overline{X}$ = 3.73, S.D. = 0.83).The least implemented aspect in the current situation is that teachers should adopt a variety of teaching modes, such as flipped classrooms, blended teaching, etc., to better stimulate students' learning interest and independent learning ability. ($\overline{X}$ = 3.54, S.D. = 0.85).

Regarding the expected situations of students' sustainable learning ability (Teacher factors) in higher vocational colleges in Guangdong Province, the overall expectation is at a very high level ($\overline{X}$ = 4.51, S.D. = 0.52). When considering each aspect individually, the most highly expected aspect is that teachers should strengthen the study and research of independent learning theory, constantly improve teaching

ability and teaching methods, and guide students to carry out independent learning. ($\overline{X}$ = 4.57, S.D. = 0.69). The second most highly expected aspect is that teachers should provide students with the opportunity to try and make mistakes, and cultivate students' creativity and exploration spirit. ($\overline{X}$ = 4.55, S.D. = 0.72). The least highly expected aspect is that teachers should adopt a variety of teaching modes, such as flipped classrooms, blended teaching, etc., to better stimulate students' learning interest and independent learning ability. ($\overline{X}$ = 4.44, S.D. = 0.76).

Table 4.6 Examination the current situation and expected situation of students' sustainable learning ability in higher vocational colleges in Guangdong Province: Student factors (n=384)

Students' sustainable learning ability: Student factors	Current Situation(D)			Expected condition		
	$\overline{X}$	S.D.	Level	$\overline{X}$	S.D.	Level
1. Students should arrange their time reasonably, improve their learning efficiency, avoid procrastination, and establish good learning habits.	3.65	0.86	High	4.51	0.72	Highest
2. Students should have effective learning strategies, such as reading skills, note-taking methods, review methods, etc., to improve learning efficiency and effectiveness.	3.63	0.87	High	4.48	0.74	High
3. Students should have the ability to information retrieval, learn to use a variety of channels to obtain information, and screen and judge information.	3.73	0.79	High	4.58	0.66	Highest
4. Students should think independently, dare to question, and critically analyze to form their own opinions and judgments.	3.63	0.90	High	4.44	0.76	High
5. Students should learn self-motivation and self-management, maintain a positive learning attitude and good learning habits	3.71	0.83	High	4.56	0.70	Highest
6. Students should regularly reflect on their learning process, sum up their learning experience, find out their shortcomings in learning, and adjust their learning strategies according to the evaluation results to continuously improve their learning ability.	3.64	0.87	High	4.48	0.73	High

Table 4.6 (continued).

(n=384)

Students' sustainable learning ability: Student factors	Current Situation(D)			Expected condition		
	$\overline{X}$	S.D.	Level	$\overline{X}$	S.D.	Level
7. Students should be willing to try and make mistakes, learn from mistakes, and constantly improve their learning methods.	3.59	0.88	High	4.49	0.77	High
8. Students should set clear learning goals and formulate specific learning plans according to the goals to make learning more directional and purposeful.	3.70	0.80	High	4.57	0.69	Highest
9. Students should overcome the difficulties and setbacks in the learning process, persevere in learning, actively seek help, and constantly improve their learning ability.	3.48	0.89	moderate	4.37	0.78	High
10. Students should maintain an optimistic attitude, enjoy the process of learning, believe that they can learn well, have fun and a sense of achievement from learning, to love learning more.	3.63	0.86	High	4.49	0.77	High
Total	**3.64**	**0.48**	**High**	**4.51**	**0.43**	**Highest**

Analysis of the Current and Expected Situations of Students' Sustainable Learning Ability in Higher Vocational Colleges in Guangdong Province: Student Factors

From Table 4.6, it was found that the current situation of students' sustainable learning ability (Student factors) in higher vocational colleges in Guangdong Province, overall, is at a high level ($\overline{X}$ = 3.64, S.D. = 0.48). When considering each aspect individually, the most highly implemented aspect in the current situation is that students should have the ability of information retrieval, learn to use a variety of channels to obtain information, and screen and judge information. ($\overline{X}$ = 3.73, S.D. = 0.79). The second most implemented aspect is that students should learn self-

motivation and self-management, maintain a positive learning attitude, and have good learning habits. ($\overline{X}$ = 3.71, S.D. = 0.83). The least implemented aspect in the current situation is that students should overcome the difficulties and setbacks in the learning process, persevere in learning, actively seek help, and constantly improve their learning ability. ($\overline{X}$ = 3.48, S.D. = 0.89).

Regarding the expected situations of students' sustainable learning ability (Student factors) in higher vocational colleges in Guangdong Province, the overall expectation is at a very high level ($\overline{X}$ = 4.51, S.D. = 0.43). When considering each aspect individually, the most highly expected aspect is that students should have the ability of information retrieval, learn to use a variety of channels to obtain information, and screen and judge information. ($\overline{X}$ = 4.58, S.D. = 0.66). The second most highly expected aspect is that students should set clear learning goals and formulate specific learning plans according to the goals to make learning more directional and purposeful. ($\overline{X}$ = 4.57, S.D. = 0.69). The least highly expected aspect is that students should overcome the difficulties and setbacks in the learning process, persevere in learning, actively seek help, and constantly improve their learning ability. ($\overline{X}$ = 4.37, S.D. = 0.78).

The results of the first research question, What are the current and expected situations of students' sustainable learning ability in higher vocational colleges in Guangdong Province are presented in Table 4.7

Table 4.7 Examination the current situation and expected situation of students' sustainable learning ability in higher vocational colleges in Guangdong Province

Students' sustainable learning ability	Current Situation(D)			Expected condition		
	$\overline{X}$	S.D.	Level	$\overline{X}$	S.D.	Level
1. School environment factors	3.77	0.62	High	4.53	0.48	Highest
2. Teacher factors	3.67	0.64	High	4.51	0.52	Highest
3. Student factors	3.64	0.48	High	4.51	0.43	Highest
Total of all factors	**3.69**	**0.49**	**High**	**4.52**	**0.39**	**Highest**

According to Table 4.7, the sustainable learning ability of students in higher vocational colleges in Guangdong Province is influenced by three key factors: school environment, teacher, and student factors.

The current situation of these abilities was rated as high, with an overall mean score of 3.69. Among the factors, the school environment had the highest mean score (3.77), while student factors had the lowest (3.64).

In the expected situation the sustainable learning ability was rated higher, with an overall mean score of 4.52. The school environment again scored the highest (4.53), followed by teacher and student factors, both with a mean score of 4.51.

After obtaining the analysis results of the current and expected situations of students' sustainable learning ability in higher vocational colleges in Guangdong Province, the researcher will use these results to analyze the priority needs (PNIModified) for the development of students' sustainable learning ability in higher vocational colleges in Guangdong Province.

Stage 2: Results of the Development of Educational Management Strategies to Improve Students' Sustainable Learning Ability in Higher Vocational Colleges in Guangdong Province

Step 1 **Analysis of Needs, Strengths, Weaknesses, Opportunities, and Threats for developing students' sustainable learning ability** in higher vocational colleges in Guangdong Province

Results of the Analysis of Needs, Strengths, Weaknesses, Opportunities, and Threats for developing students' sustainable learning ability in higher vocational colleges in Guangdong Province

The researcher analyzed the priority needs, strengths, weaknesses Opportunities, and Threats for developing students' sustainable learning ability in higher vocational colleges in Guangdong Province. The details are presented in Tables 4.8 - 4.11.

Table 4.8 The Essential Needs and Environmental Analysis for developing students' sustainable learning ability in Higher Vocational Colleges in Guangdong Province: School environment factors

Students' sustainable learning ability: School environment factors	Current Situation	Expected condition	PNI	Rank	S	W
1. The school should give students the initiative in learning and encourage them to ask questions, participate in discussions, and explore independently.	3.76	4.48	0.19	5	✓	
2. The school should design open-ended courses to guide students to acquire knowledge through independent inquiry and develop the ability to analyze and solve problems.	3.79	4.55	0.70	4		✓
3. The school should connect learning content with real life and allow students to design and implement projects independently, reflect on their experiences, and evaluate their progress to deepen and broaden their learning.	3.83	4.52	0.18	6	✓	
4. The Schools should provide a variety of learning resources and tools, such as library resources, equipment, networks, online learning platforms, field trips, etc., to meet the different learning needs and preferences of students.	3.87	4.54	0.17	7	✓	
5. The school should provide a good autonomous learning space where students can focus on their studies without interruption.	3.80	4.58	0.21	3		✓
6. The school should integrate the concept of autonomous learning into its culture and establish relevant regulations and measures.	3.80	4.54	0.19	5	✓	

Table 4.8 (continued).

Students' sustainable learning ability: School environment factors	Current Situation	Expected condition	PNI	Rank	S	W
7. The school should encourage students to participate in school management and provide a platform for them to express their opinions.	3.77	4.51	0.20	4	✓	
8. The school should work with parents to explore ways to cultivate students' autonomous learning abilities and reach a consensus on educational philosophy and methods.	3.70	4.53	0.22	2		✓
9. The school should guide parents to change their traditional "filling-in-the-blanks" style of education and instead encourage their children to learn independently and respect their children's learning interests and characteristics.	3.73	4.51	0.21	3		✓
10. The school should integrate community learning resources to Effectively enhance the quality of students' education.	3.63	4.49	0.24	1		✓
Total School environmental factors	**3.77**	**4.53**	**0.20**	**3**	✓	

Table 4.8 shows that the overall rating of students' sustainable learning abilities, under school environment factors, was high ($\overline{X}$ = 3.77). The highest-rated aspect was providing diverse learning resources and tools ($\overline{X}$ = 3.87), and The lowest-rated aspect was the integration of community learning resources to enhance the quality of students' education ($\overline{X}$ = 3.63).

The expected situation for school environment factors was rated the highest overall ($\overline{X}$ = 4.53). The top-rated expectation was providing autonomous learning spaces ($\overline{X}$ = 4.58), The lowest-rated expectation was that the school should encourage students to take initiative in learning, ask questions, participate in discussions, and explore independently ($\overline{X}$ = 4.48).

The Modified Priority Needs Index ($PNI_{Modified}$) = 0.20 identified the integration of community learning resources as the most urgent weakness requiring improvement ($PNI_{Modified}$ = 0.24). Conversely, the greatest strength was the provision of diverse learning resources and tools, such as libraries, equipment, networks, online platforms, and field trips, to meet the varied needs and preferences of students ($PNI_{Modified}$ = 0.17).

Table 4.9 The Essential Needs and Environmental Analysis for Developing Students' Sustainable Learning Ability in Higher Vocational Colleges in Guangdong Province: Teacher factors

Students' sustainable learning ability: Teacher factors	Current Situation	Expected condition	PNI	Rank	S	W
1. Teachers should pay attention to the thinking, exploration, cooperation, etc., in the learning process of students, not just the result.	3.70	4.51	0.22	4	✓	
2. Teachers should use a variety of evaluation methods, such as classroom performance, homework completion, project results, self-reflection, etc., to comprehensively evaluate students' learning.	3.73	4.53	0.21	5	✓	
3. Teachers should give timely feedback to students to help them understand their learning situation and make improvements based on the feedback.	3.73	4.53	0.21	5	✓	
4. A teacher? We should encourage students to learn, communicate, and cooperate, establish a good relationship between teachers and students, and make students feel safe, trusted, and respected.	3.76	4.54	0.21	5	✓	

Table 4.9 (continued).

Students' sustainable learning ability: Teacher factors	Current Situation	Expected condition	PNI	Rank	S	W
5. Teachers should provide students with the opportunity to try and make mistakes, and cultivate students' creativity and exploration spirit.	3.69	4.55	0.23	3	✓	
6. What do teachers want? Organize students to participate in field trips, combine theoretical knowledge with practice, and enhance students' learning interests and understanding abilities.	3.61	4.47	0.24	2		✓
7. Teachers should strengthen the study and research of independent learning theory, constantly improve teaching ability and teaching methods, and guide students to carry out independent learning.	3.70	4.57	0.24	2		✓
8. Teachers should adopt a variety of teaching modes, such as flipped classrooms, blended teaching, etc., to better stimulate students' learning interest and independent learning ability.	3.54	4.44	0.25	1		✓
9. Teachers should strengthen team cooperation, learn from each other, communicate and cooperate, and jointly explore and practice effective strategies for independent learning.	3.56	4.45	0.25	1		✓
10. Teachers should actively learn and master new knowledge and technology, keep pace with the development of The Times, and provide students with better learning resources and guidance	3.66	4.50	0.23	3	✓	
Total: Teacher factors	**3.67**	**4.51**	**0.23**	2		✓

Table 4.9 shows that teacher factors in the current situation were rated high overall ($\overline{X}$ = 3.67). The highest-rated aspect was fostering a safe, trusted, and respectful teacher-student relationship ($\overline{X}$ = 3.76), The lowest-rated aspect was adopting varied teaching modes, such as flipped classrooms and blended teaching, to enhance students' interest and independent learning ($\overline{X}$ = 3.54).

The expected situation for teacher factors was rated at the highest level overall ($\overline{X}$ = 4.51). The most anticipated aspect was improving teaching methods to promote independent learning ($\overline{X}$ = 4.57), The lowest-rated expectation was adopting diverse teaching modes, such as flipped classrooms and blended teaching, to enhance students' interest and independent learning ($\overline{X}$ = 4.54).

The Modified Priority Needs Index ($PNI_{Modified}$) = 0.23 highlighted two key areas: the most urgent weaknesses being teachers adopting diverse teaching modes and strengthening team cooperation ($PNI_{Modified}$ = 0.25). Conversely, the greatest strengths were using various evaluation methods, providing timely feedback, and fostering a supportive teacher-student relationship ($PNI_{Modified}$ = 0.21).

Table 4.10 The Essential Needs and Environmental Analysis for Developing Students' Sustainable Learning Ability in Higher Vocational Colleges in Guangdong Province: Student factors

Students' sustainable learning ability: Student factors	Current Situation	Expected condition	PNI	Rank	S	W
1. Students should arrange their time reasonably, improve their learning efficiency, avoid procrastination, and establish good learning habits.	3.65	4.51	0.24	3		✓
2. Students should have effective learning strategies, such as reading skills, note-taking methods, review methods, etc., to improve learning efficiency and effectiveness.	3.63	4.48	0.23	4	✓	
3. Students should have the ability to information retrieval, learn to use a variety of channels to obtain information, and to screen and judge information.	3.73	4.58	0.23	4	✓	
4. Students should think independently, dare to question, and critically analyze to form their own opinions and judgments.	3.63	4.44	0.22	5	✓	
5. Students should learn self-motivation and self-management, maintain a positive learning attitude and good learning habits.	3.71	4.56	0.23	4	✓	
6. Students should regularly reflect on their learning process, sum up their learning experience, find out their shortcomings in learning, and adjust their learning strategies according to the evaluation results to continuously improve their learning ability.	3.64	4.48	0.23	4	✓	
7. Students should be willing to try and make mistakes, learn from mistakes, and constantly improve their learning methods.	3.59	4.49	0.25	2		✓

Table 4.10 (continued).

Students' sustainable learning ability: Student factors	Current Situation	Expected condition	PNI	Rank	S	W
8. Students should set clear learning goals and formulate specific learning plans according to the goals to make learning more directional and purposeful.	3.70	4.57	0.24	3	✓	
9. Students should overcome the difficulties and setbacks in the learning process, persevere in learning, actively seek help, and constantly improve their learning ability.	3.48	4.37	0.26	1		✓
10. Students should maintain an optimistic attitude, enjoy the process of learning, believe that they can learn well, have fun and a sense of achievement from learning, to love learning more.	3.63	4.49	0.24	3	✓	
Total: Student factors	**3.64**	**4.51**	**0.24**	1		✓

Table 4.10 shows that student factors in the current situation were rated high overall ($\overline{X}$ = 3.64). The highest-rated aspect was the ability to retrieve, screen, and judge information ($\overline{X}$ = 3.73), while the lowest-rated aspect was perseverance and seeking help to overcome learning challenges ($\overline{X}$ = 3.48).

Expected student factors were rated at the highest level overall ($\overline{X}$ = 4.51). The top expectation was improving information retrieval and judgment skills ($\overline{X}$ = 4.58) followed by self-motivation and self-management ($\overline{X}$ = 4.56). The lowest-rated expectation was perseverance and seeking help to overcome learning challenges ($\overline{X}$ = 4.51).

The Modified Priority Needs Index ($PNI_{Modified}$) = 0.24 highlighted two key areas: the most urgent weakness being that students should overcome difficulties and setbacks in the learning process, persevere in learning, actively seek help, and constantly improve their learning abilities ($PNI_{Modified}$ = 0.26). Conversely, the greatest

strength was that students should think independently, dare to question, and critically analyze to form their own opinions and judgments (PNIModified = 0.22).

Table 4.11 The essential needs and environmental analysis for developing students' sustainable learning ability in Higher Vocational Colleges in Guangdong Province

Students' sustainable learning ability	Current Situation(D)		Expected condition		PNI	Rank	S	W
	$\overline{X}$	Level	$\overline{X}$	Level				
1. School environment factors	3.77	High	4.53	Highest	0.20	3	✓	
2. Teacher factors	3.67	High	4.51	Highest	0.23	2		✓
3. Student factors	3.64	High	4.51	Highest	0.24	1		✓
Total of all factors	**3.69**	**High**	**4.52**	**Highest**	0.22			

According to Table 4.11, the sustainable learning ability of students in higher vocational colleges in Guangdong Province is influenced by three key factors: school environment, teacher, and student factors. The current state of these abilities was rated as high, with an overall mean score of 3.69. Among the factors, the school environment had the highest mean score (3.77), while student factors had the lowest (3.64).

In the expected state, sustainable learning abilities were rated the highest level, with an overall mean score of 4.52. The school environment again scored the highest (4.53), followed by teacher and student factors, with a mean score of 4.51. The Modified Priority Needs Index ($PNI_{Modified}$) for these abilities was calculated as 0.22, with student factors showing the highest $PNI_{Modified}$ value (0.24), followed by teacher factors (0.23), and school environment factors (0.20).

These findings identify student and teacher factors as weaknesses requiring strategic improvement, while the school environment is recognized as a strength to be reinforced. The results provide essential insights for drafting educational management strategies aimed at enhancing students' sustainable learning abilities in higher vocational colleges in Guangdong Province.

Step 2 Drafting the Development of Strategies for Improving Students' Sustainable Learning Ability in Higher Vocational Colleges in Guangdong Province using the SWOT/TOWS Matrix Technique

The analysis and synthesis of educational management strategies to improve students' sustainable learning ability in higher vocational colleges in Guangdong Province were conducted. The results are presented in the SWOT analysis table, illustrating the development of strategies to enhance sustainable learning abilities. The strategies were synthesized using the TOWS Matrix technique, and the draft educational management strategies to improve students' sustainable learning ability in higher vocational colleges in Guangdong Province is shown in Table 4.12 – 4.14

Table 4.12 SWOT Analysis: Development of educational management strategies to Improve students' sustainable learning ability in Higher Vocational. Colleges in Guangdong Province: School environment factors

1. School environment factors	
Strengths (S)	**Weaknesses (W)**
4. The Schools should provide a variety of learning resources and tools, such as library resources, equipment, networks, online learning platforms, field trips, etc., to meet the different learning needs and preferences of students. 3. The school should connect learning content with real life and allow students to design and implement projects independently, reflect on their experiences, and evaluate their progress to deepen and broaden their learning. 6. The school should integrate the concept of autonomous learning into its culture and establish relevant regulations and measures.	10. The school should integrate community learning resources to effectively enhance the quality of students' education. 8. The school should work with parents to explore ways to cultivate students' autonomous learning abilities and reach a consensus on educational philosophy and methods. 9. The school should guide parents to change their traditional "filling-in-the-blanks" style of education and instead encourage their children to learn independently and respect their children's learning interests and
Opportunities (O)	**Threats (T)**
1. The state provides policy support for vocational education, which helps schools strengthen education management and enhance students' sustainable independent learning ability. 2. The shortage of skilled personnel in society and the broad employment prospects of Students help to motivate students' sustainable independent learning ability. 3. The progress of science and technology brings more new teaching equipment and teaching methods, which helps schools cultivate students' sustainable independent learning abilities.	1. Increasing competition in the market increases the pressure on schools to enhance students' sustainable independent learning ability. 2. Higher vocational colleges and universities are affected by the lack of student sources, which affects the quality of education in Schools and the sustainable independent learning ability of students. 3. The continuous change in science and technology has put forward new challenges to the cultivation of students' sustainable independent learning ability

Table 4.13 SWOT Analysis: Development of educational management strategies to Improve students' sustainable learning ability in Higher Vocational. Colleges in Guangdong Province: Teacher factors

2. Teacher factors	
Strengths (S)	**Weaknesses (W)**
2. Teachers should use a variety of evaluation methods, such as classroom performance, homework completion, project results, self-reflection, etc., to comprehensively evaluate students' learning. 3. Teachers should give timely feedback to students to help them understand their learning situation and make improvements based on the feedback. 4. A teacher? We should encourage students to learn, communicate, and cooperate with each other, establish a good relationship between teachers and students, and make students feel safe, trusted, and respected.	8. Teachers should adopt a variety of teaching modes, such as flipped classrooms, blended teaching, etc., to better stimulate students' learning interest and independent learning ability. 9. Teachers should strengthen team cooperation, learn from each other, communicate and cooperate, and jointly explore and practice effective strategies for independent learning. 6. What do teachers want? Organize students to participate in field trips, combine theoretical knowledge with practice, and enhance students' learning interests and understanding abilities. 7. Teachers should strengthen the study and research of independent learning theory, constantly improve teaching ability and teaching methods, and guide students to carry out independent learning.
Opportunities (O)	**Threats (T)**
1. The state provides policy support for vocational education, which helps schools strengthen education management and enhance students' sustainable independent learning ability.	1. Increasing competition in the market increases the pressure on schools to enhance students' sustainable independent learning ability.

Table 4.13 (continued).

Opportunities (O)	Threats (T)
2. The shortage of skilled personnel in society and the broad employment prospects of students help to motivate students' sustainable independent learning ability 3. The progress of science and technology brings more new teaching equipment and teaching methods, which helps schools cultivate students' sustainable independent learning abilities.	2. Higher vocational colleges and universities are affected by the lack of student sources, which affects the quality of education in schools and the sustainable independent learning ability of students. 3. The continuous change in science and technology has put forward new challenges to the cultivation of students' sustainable independent learning ability.

Table 4.14 SWOT Analysis: Development of Educational Management Strategies to Improve Students' Sustainable Learning Ability in Higher Vocational Colleges in Guangdong Province: Student factors

3. Student factors	
Strengths (S)	**Weaknesses (W)**
4. Students should think independently, dare to question, and critically analyze to form their own opinions and judgments. 2. Students should have effective learning strategies, such as reading skills, note-taking methods, review methods, etc., to improve learning efficiency and effectiveness. 3. Students should have the ability to information retrieval, learn to use a variety of channels to obtain information, and to screen and judge information. 5. Students should learn self-motivation and self-management, maintain a positive learning attitude and good learning habits 6. Students should regularly reflect on their learning process, sum up their learning experience, find out their shortcomings in learning, and adjust their learning strategies according to the evaluation results to continuously improve their learning ability.	9. Students should overcome the difficulties and setbacks in the learning process, persevere in learning, actively seek help, and constantly improve their learning ability. 7. Students should be willing to try and make mistakes, learn from mistakes, and constantly improve their learning methods. 1. Students should arrange their time reasonably, improve their learning efficiency, avoid procrastination, and establish good learning habits. 8. Students should set clear learning goals and formulate specific learning plans according to the goals to make learning more directional and purposeful. 10. Students should maintain an optimistic attitude, enjoy the process of learning, believe that they can learn well, have fun and a sense of achievement from learning, to love learning more.
Opportunities (O)	**Threats (T)**
1. The state provides policy support for vocational education, which helps schools strengthen education management and Enhance students' sustainable independent learning ability.	1. Increasing competition in the market increases the pressure on schools to enhance Students' sustainable independent learning ability.

Table 4.14 (continued).

Opportunities (O) (continued).	**Threats (T)** (continued).
2. The shortage of skilled personnel in society and the broad employment prospects of students help to motivate students' sustainable independent learning ability 3. The progress of science and technology brings more new teaching equipment and teaching methods, which helps schools cultivate students' sustainable independent learning abilities.	2. Higher vocational colleges and universities are affected by the lack of student sources, which affects the quality of education in schools and the sustainable independent learning ability of students. 3. The continuous change in science and technology has put forward new challenges to the cultivation of students' sustainable independent learning ability.

The results of the analysis and synthesis of the draft Educational Management Strategies to Improve Students' Sustainable Learning Ability in Higher Vocational Colleges in Guangdong Province using the TOWS Matrix technique are presented in Table 4.15.

Table 4.15 The Strategic Analysis Data Using the TOWS Matrix

	Strategy: S	**Weakness: W**
	S1: Schools should offer diverse learning resources and tools, including libraries, equipment, networks, online platforms, and field trips, to cater to students' varied learning needs and preferences. S2: Teachers should use diverse evaluation methods, provide timely feedback, and foster a supportive and collaborative environment to build trust, respect, and effective teacher-student relationships. S3: Students should think independently, dare to question, and critically analyze to form their own opinions and judgments.	W1: The school should integrate community learning resources to effectively enhance the quality of students' education. W2: Teachers should adopt diverse teaching methods and strengthen teamwork to enhance student's interest and ability in independent learning W3: Students should overcome the difficulties and setbacks in the learning process, persevere in learning, actively seek help, and constantly improve their learning ability.
Opportunity: O O1: The state provides policy support for vocational education, which helps schools strengthen education management and enhance students' sustainable independent learning ability.	**Proactive Strategies (SO)** 1. Innovative Learning Ecosystem Strategy 2. Empowered Teaching and Learning Strategy 3. Policy-Driven Critical Thinking Development Strategy	**Corrective Strategies (WO)** 1. Collaborative Vocational Education Enhancement Strategy 2. Integrated Teaching and Policy Advancement Strategy 3. Technology-Driven Resilience Enhancement Strategy

Table 4.15 (continued).

Opportunity: O O2: The shortage of skilled personnel in society and the broad employment prospects of students help to motivate students' sustainable independent learning ability. O3: The progress of science and technology brings more new teaching equipment and teaching methods, which helps schools cultivate students' sustainable independent learning abilities.		
Threat: T T1 Increasing competition in the market increases the pressure on schools to enhance students' sustainable independent learning ability. T2 Higher vocational colleges and universities are affected by the lack of student sources, which affects the quality of education in schools and the sustainable independent learning ability of students. T3 The continuous change in science and technology has put forward new challenges to the cultivation of students' sustainable independent learning ability.	**Preventive Strategies (ST)** 1. Future-Ready Learning Ecosystem Strategy. 2. Resilient Teaching and Feedback Strategy 3. Dynamic Teaching and Feedback Strategy	**Defensive Strategies (WT)** 1. Community-Engaged Education Enhancement Strategy 2. Resilient Teaching and Feedback Strategy 3. Dynamic Teaching and Feedback Strategy

According to Table 4.15, the draft educational management strategies to improve students' sustainable learning ability in higher vocational colleges in Guangdong Province includes the following:

Proactive Strategies (SO): A combination of Strengths (S) and Opportunities (O), comprising 3 strategies: 1) Innovative Learning Ecosystem Strategy, 2) Empowered Teaching and Learning Strategy, 3) Policy-Driven Critical Thinking Development Strategy, and 4 proposed projects to support the strategies.

Corrective Strategies (WO): A combination of Weaknesses (W) and Opportunities (O), comprising 3 strategies: 1) Collaborative Vocational Education Enhancement Strategy, 2) Integrated Teaching and Policy Advancement Strategy,

3) Technology-Driven Resilience Enhancement Strategy, and 4 proposed projects to support the strategies.

Preventive Strategies (ST): A combination of Strengths (S) and Threats (T), comprising 3 strategies: 1. Future-Ready Learning Ecosystem Strategy, 2) Resilient Teaching and Feedback Strategy, 3) Dynamic Teaching and Feedback Strategy, and 4 proposed projects to support the strategies.

Defensive Strategies (WT): A combination of Weaknesses (W) and Threats (T), comprising 3 strategies: 1) Community-Engaged Education Enhancement Strategy, 2) Resilient Teaching and Feedback Strategy, 3) Dynamic Teaching and Feedback Strategy, and 4 proposed projects to support the strategies.

The details are presented in Table 4.16 -4.18

Table 4.16 TOWS Matrix: Development of Educational Management Strategies to Improve Students' Sustainable Learning Ability in Higher Vocational Colleges in Guangdong Province: School environment factors

School environment factors	
Proactive Strategies (SO)	**Corrective Strategies (WO)**
Innovative Learning Ecosystem Strategy Supporting Projects: 1. Smart Learning Ecosystem Development Project 2. Advancing Policy-Driven Reforms Education Enhancement Program 3. Learning Resources Optimization Initiative 4. Educator Innovation Training Program	**Collaborative Vocational Education Enhancement Strategy** Supporting Projects: 1. Community Learning Resource Partnership Program 2. Policy-Driven Community Engagement Initiative 3. Vocational Skill Development and Community Internship Program 4. Community-Based Education Resource Hub
Preventive Strategies (ST)	**Defensive Strategies (WT)**
Future-Ready Learning Ecosystem Strategy Supporting Projects: 1. Inclusive Learning Resource Access Initiative 2. Collaborative Recruitment and Outreach Program 3. Quality Assurance and Retention Enhancement Project 4. Resource-Based Learning Campaign	**Community-Engaged Education Enhancement Strategy** Supporting Projects: 1. Community Outreach and Resource Sharing Program 2. Targeted Recruitment Campaigns 3. Community-Based Learning and Internship Initiative 4. Educational Resource Hub Development

Table 4.17 TOWS Matrix: Development of Educational Management Strategies to Improve Students' Sustainable Learning Ability in Higher Vocational Colleges in Guangdong Province: Teacher factors

Teacher factors	
Proactive Strategies (SO)	**Corrective Strategies (WO)**
Empowered Teaching and Learning Strategy Supporting Projects: 1. Digital Evaluation and Feedback System Development Project 2. Tech-Driven Collaborative Teaching Program 3. Smart Classroom Implementation Initiative 4. Innovative Teaching Practices Workshop	**Integrated Teaching and Policy Advancement Strategy** Supporting Projects: 1. Diverse Teaching Methods Training Program 2. Team-Based Teaching Innovation Initiative 3. Policy-Driven Teaching Collaboration Network 4. Student-Centered Learning Projects
Preventive Strategies (ST)	**Defensive Strategies (WT)**
Resilient Teaching and Feedback Strategy Supporting Projects: 1. Continuous Professional Development Program for Teachers 2. Dynamic Assessment and Feedback System Initiative 3. Teacher-Student Collaboration Enhancement Project 4. Technology-Adaptive Teaching Practices Workshop	**2. Innovative Teaching and Collaboration Strategy** Supporting Projects: 1. Teacher Training on Emerging Technologies Program 2. Collaborative Teaching Innovation Workshops 3. Technology-Enhanced Independent Learning Support System 4. Cross-Disciplinary Team Teaching Initiatives

Table 4.18 TOWS Matrix: Development of Educational Management Strategies to Improve Students' Sustainable Learning Ability in Higher Vocational Colleges in Guangdong Province: Student factors

Student factors	
Proactive Strategies (SO)	**Corrective Strategies (WO)**
Policy-Driven Critical Thinking Development Strategy Supporting Projects: 1. Vocational Critical Thinking Curriculum Enhancement Program 2. Independent Learning and Judgment Workshop Series 3. Policy-Supported Vocational Learning Labs 4. Critical Thinking Mentorship Program	**3. Technology-Driven Resilience Enhancement Strategy** Supporting Projects: 1. Resilience and Perseverance Development Program 2. Tech-Integrated Learning Support Network 3. Adaptive Learning Tools Implementation 4. Mentorship and Motivation Campaign
Preventive Strategies (ST)	**Defensive Strategies (WT)**
Dynamic Teaching and Feedback Strategy Supporting Projects: 1. Independent Thinking and Market Awareness Program 2. Competitive Edge Learning Modules 3. Industry Collaboration and Internship Program 4. Student-Centered Learning Enhancement Project	**Resilience and Market-Ready Learning Strategy** Supporting Projects: 1. Resilience-Building Support Program 2. Career and Competency Development Workshops 3. Individualized Learning Support Network 4. Student Engagement and Motivation Campaign

From Table 4.16 - 4.18, it was found that there are 12 strategies in total for developing students' sustainable learning abilities, namely:

1. **Proactive Strategies (SO)**

1.1 Innovative Learning Ecosystem Strategy

Supporting Projects:

1.1.1 Smart Learning Ecosystem Development Project

1.1.2 Advancing Policy-Driven Reforms Education Enhancement Program

1.1.3 Learning Resources Optimization Initiative

1.1.4 Educator Innovation Training Program

1.2 Empowered Teaching and Learning Strategy

Supporting Projects:

1.2.1 Digital Evaluation and Feedback System Development Project

1.2.2 Tech-Driven Collaborative Teaching Program

1.2.3 Smart Classroom Implementation Initiative

1.2.4 Innovative Teaching Practices Workshop

1.3 Policy-Driven Critical Thinking Development Strategy

Supporting Projects:

1.3.1 Vocational Critical Thinking Curriculum Enhancement Program

1.3.2 Independent Learning and Judgment Workshop Series

1.3.3 Policy-Supported Vocational Learning Labs

1.3.4 Critical Thinking Mentorship Program

2. Preventive Strategies (ST)

2.1 Future-Ready Learning Ecosystem Strategy

Supporting Projects:

2.1.1 Inclusive Learning Resource Access Initiative

2.1.2 Collaborative Recruitment and Outreach Program

2.1.3 Quality Assurance and Retention Enhancement Project

2.1.4 Resource-Based Learning Campaign

2.2 Resilient Teaching and Feedback Strategy

Supporting Projects:

2.2.1 Continuous Professional Development Program for Teachers

2.2.2 Dynamic Assessment and Feedback System Initiative

2.2.3 Teacher-Student Collaboration Enhancement Project

2.2.4 Technology-Adaptive Teaching Practices Workshop

2.3 Dynamic Teaching and Feedback Strategy

Supporting Projects:

2.3.1 Independent Thinking and Market Awareness Program

2.3.2 Competitive Edge Learning Modules

2.3.3 Industry Collaboration and Internship Program

2.3.4 Student-Centered Learning Enhancement Project

3. Corrective Strategies (WO)

3.1 Collaborative Vocational Education Enhancement Strategy

Supporting Projects:

3.1.1 Community Learning Resource Partnership Program

3.1.2 Policy-Driven Community Engagement Initiative

3.1.3 Vocational Skill Development and Community Internship Program

3.1.4 Community-Based Education Resource Hub

3.2 Integrated Teaching and Policy Advancement Strategy

Supporting Projects:

3.2.1 Diverse Teaching Methods Training Program

3.2.2 Team-Based Teaching Innovation Initiative

3.2.3 Policy-Driven Teaching Collaboration Network

3.2.4 Student-Centered Learning Projects

3.3 Technology-Driven Resilience Enhancement Strategy

Supporting Projects:

3.3.1 Resilience and Perseverance Development Program

3.3.2 Tech-Integrated Learning Support Network

3.3.3 Adaptive Learning Tools Implementation

3.3.4 Mentorship and Motivation Campaign

4. Defensive Strategies (WT)

4.1 Community-Engaged Education Enhancement Strategy

Supporting Projects:

4.1.1 Community Outreach and Resource Sharing Program

4.1.2 Targeted Recruitment Campaigns

4.1.3 Community-Based Learning and Internship Initiative

4.1.4 Educational Resource Hub Development

4.2 Innovative Teaching and Collaboration Strategy

Supporting Projects:

4.2.1 Teacher Training on Emerging Technologies Program

4.2.2 Collaborative Teaching Innovation Workshops

4.2.3 Technology-Enhanced Independent Learning Support System

4.2.4 Cross-Disciplinary Team Teaching Initiatives

4.3 Resilience and Market-Ready Learning Strategy

Supporting Projects:

4.3.1 Resilience-Building Support Program

4.3.2 Career and Competency Development Workshops

4.3.3 Individualized Learning Support Network

4.3.4 Student Engagement and Motivation Campaign

Step 3 Develop educational management strategies to improve students' sustainable learning ability in higher vocational colleges in Guangdong Province.

The development of educational management strategies to improve students' sustainable learning ability in higher vocational colleges in Guangdong Province involved validating the drafted strategies. The researcher conducted a focus group discussion (FGD) with twelve experts to assess the appropriateness and feasibility of the drafted educational management strategies. The results of this assessment are presented in Table 4.19

Table 4.19 Expert Evaluation of the Adaptability and Feasibility of the Draft Educational Management Strategies to Improve Students' Sustainable Learning Ability.

Assessment checklist	Adaptability			Feasibility		
	$\overline{X}$	S.D.	Level	$\overline{X}$	S.D.	Level
SO Strategy						
1. Innovative Learning Ecosystem Strategy	4.88	0.35	highest	4.75	0.46	highest
2. Empowered Teaching and Learning Strategy	4.38	0.52	high	4.25	0.46	high
3. Policy-Driven Critical Thinking Development Strategy	4.75	0.46	highest	4.75	0.46	highest
Total aspects 1	4.67	0.44	highest	4.58	0.46	highest
ST Strategy						
1. Future-Ready Learning Ecosystem Strategy	4.75	0.46	highest	4.63	0.52	highest
2. Resilient Teaching and Feedback Strategy	4.88	0.35	highest	4.63	0.52	highest
3. Dynamic Teaching and Feedback Strategy	4.88	0.35	highest	4.63	0.52	highest
Total aspects 2	4.84	0.39	highest	4.63	0.52	highest
WO Strategy						
1. Collaborative Vocational Education Enhancement Strategy	4.13	0.35	high	4.13	0.35	high
2. Integrated Teaching and Policy Advancement Strategy	4.75	0.46	highest	4.63	0.52	highest
3. Technology-Driven Resilience Enhancement Strategy	5.00	0.00	highest	4.88	0.35	highest

Table 4.19 (continued).

Assessment checklist	Adaptability			Feasibility		
	$\overline{X}$	S.D.	Level	$\overline{X}$	S.D.	Level
Total aspects 3	4.63	0.27	highest	4.55	0.41	highest
WT Strategy						
1. Community-Engaged Education Enhancement Strategy	4.63	0.52	highest	4.63	0.52	highest
2. Innovative Teaching and Collaboration Strategy	4.75	0.46	highest	4.50	0.54	highest
3. Resilience and Market-Ready Learning Strategy	4.75	0.46	highest	4.63	0.52	highest
Total aspects 4	4.71	0.48	highest	4.59	0.53	highest
Total all aspects	4.71	0.40	highest	4.59	0.48	highest

According to Table 4.19, the data show that the experts' overall evaluation of the adaptability and feasibility of the strategy is very high. The overall evaluation of feasibility is the highest (M = 4.71), while the overall evaluation of adaptability is also at a very high level (M = 4.59), indicating that the strategy demonstrates both high adaptability and feasibility.

3.2 Reviewing the Draft of Educational Management Strategies to Improve Students' Sustainable Learning Ability in Higher Vocational Colleges in Guangdong Province

Based on Tables 16–18 the results of data analysis and strategy synthesis using the SWOT Analysis and TOWS Matrix techniques were used to prioritize the educational management strategies to improve students' sustainable learning ability in Higher Vocational Colleges in Guangdong Province. The prioritization was determined based on essential needs, including the school environment, teachers, and students, and synthesized to align with the context of higher vocational colleges in Guangdong Province.

From the 12 proposed strategies, overlapping or closely related strategies were grouped to reduce redundancy and enhance operational efficiency. This process resulted in five key strategies, which can be summarized as follows:

1. Learning Ecosystem Strategy

Combines the Innovative Learning Ecosystem Strategy (SO) and Future-Ready Learning Ecosystem Strategy (ST).

2. Teaching and Learning Empowerment Strategy

Combines the Empowered Teaching and Learning Strategy (SO), Resilient Teaching and Feedback Strategy (ST), and Dynamic Teaching and Feedback Strategy (ST).

3. Policy and Collaboration-Driven Development Strategy

Combines the Policy-Driven Critical Thinking Development Strategy (SO), Integrated Teaching and Policy Advancement Strategy (WO), and Collaborative Vocational Education Enhancement Strategy (WO).

4. Technology and Resilience Integration Strategy

Combines the Technology-Driven Resilience Enhancement Strategy (WO) and Resilience and Market-Ready Learning Strategy (WT).

5. Community-engaged and Innovative Collaboration Strategy

Combines the Community-Engaged Education Enhancement Strategy (WT) and Innovative Teaching and Collaboration Strategy (WT).

Experts involved in the focus group discussions concluded that these five key strategies comprehensively address all critical aspects, are systematically actionable, and can be effectively implemented to enhance students' sustainable learning ability.

Developing educational management strategies to improve students' sustainable learning ability in higher vocational colleges in Guangdong Province involved validating the drafted strategies. The researcher conducted a focus group discussion (FGD) with eight experts to evaluate the appropriateness and feasibility of the drafted educational management strategies. The results of the strategy development are as follows:

Vision:

Empowering students’ sustainable learning abilities and professional growth through innovation, collaboration, resilience, and community-driven education in Guangdong’s higher vocational colleges.

Mission

1. Create an inclusive and adaptive educational environment that fosters innovation and supports sustainable learning for all students.

2. Enhance the capacity of educators and students through targeted training, feedback mechanisms, and dynamic teaching methods to promote independent and lifelong learning.

3. Strengthen the alignment of educational policies and partnerships to create a cohesive framework for advancing sustainable learning practices.

4. Leverage advanced technology and build resilience into educational practices to prepare students for evolving professional and societal demands.

5. Foster collaboration with community stakeholders to develop innovative programs that integrate real-world applications into the learning process, promoting sustainable outcomes.

Goals

1. To create an inclusive, supportive, and adaptive educational environment that fosters innovation and promotes sustainable learning practices for students.

2. To enhance the skills, knowledge, and teaching methodologies of educators while empowering students to engage in independent, critical, and lifelong learning.

3. To align educational policies and strengthen partnerships with stakeholders to establish a cohesive framework that advances sustainable learning and institutional development.

4. To incorporate advanced technological tools and build resilience into educational practices, equipping students with the skills needed to adapt to rapidly evolving professional and societal demands.

5. To engage community stakeholders and foster innovative collaborations that integrate real-world experiences into education, ensuring practical applications and sustainable student outcomes.

Educational Management Strategies to Improve Students' Sustainable Learning Ability in Higher Vocational Colleges in Guangdong Province

Through the process of studying the current situation and identifying the development needs of students' sustainable learning ability in higher vocational colleges in Guangdong Province, the researcher presents the proposed educational management strategies to improve students' sustainable learning ability in higher vocational colleges in Guangdong Province as follows:

Table 4.20 Educational Management Strategies to Improve Students' Sustainable Learning Ability in Higher Vocational Colleges in Guangdong Province

Strategy	Goals	Operational Approaches	Indicator
1. Learning Ecosystem Strategy	To create an inclusive, supportive, and adaptive educational environment that fosters innovation and promotes sustainable learning practices for students.	1. Developing Inclusive Learning Environments - Design and develop physical and digital environments that are accessible, inclusive, and conducive to collaborative learning. 2. Expanding Diversified Educational Resources - Provide rich and diverse teaching resources to meet the learning needs and interests of different students, including students of different cultures, backgrounds, and abilities. 3. Advancing Policy-Driven Reforms education improvement -The government formulates and implements vocational education development plans, increases financial support for vocational education, and ensures that vocational schools receive the necessary funds 4. Educator Innovation Training Program	The proportion of learning spaces redesigned for inclusivity (e.g., student accessibility). Provide a wide range of teaching materials such as textbooks, multimedia resources, digital content, and hands-on materials suitable for different learning styles (visual, auditory, kinesthetic) 3. Formulate the "National Vocational Education Reform Implementation Plan" and implement the student average funding system,

Strategy	Goals	Operational Approaches	Indicator
		-Provide regular professional training for teachers to improve their teaching skills and understanding of inclusive education so that they can better support students' learning. 5. Strengthening International Collaboration -Actively participate in international education cooperation projects and learn from advanced foreign education concepts and practical experience.	such as how much money each student gets 4. Formulate an annual training plan, including the number of trainees, time, effect, quality, etc. 5. The number and quality of international cooperation projects, and the effect of talent exchange and training.
2. Teaching and Learning Empowerment Strategy	To enhance the skills, knowledge, and teaching methodologies of educators while empowering students to engage in independent, critical, and lifelong learning.	1. Enhancing Educator Competency Development - Conduct regular professional development workshops and training programs focused on innovative teaching methods, including active learning, critical thinking, and technology integration. 2. Mentorship and Peer Support Programs - Establish mentorship systems where experienced teachers	1. Teacher Competence - Percentage of teachers participating in professional development programs. - Improvement in teacher performance evaluations post-training. 2. Curriculum Relevance

Strategy	Goals	Operational Approaches	Indicator
		guide newer educators, and create peer support groups for collaborative lesson planning and sharing best practices. 3. Dynamic Curriculum Design - Revise and update curricula to incorporate real-world applications, problem-solving skills, and student-centered learning approaches. 4. Student Empowerment Workshops - Organize workshops for students to develop self-directed learning, critical thinking, and adaptability to changing contexts. 5. Implementing Technology-Assisted Learning Tools - Provide teachers and students with access to educational technology tools that facilitate interactive and personalized learning experiences.	- Number of updated courses incorporating student-centered and real-world applications. 3. Student Learning Outcomes - Improvement in student performance in assessments measuring critical thinking and problem-solving skills. 4. Engagement with Learning Tools - Usage rates of technology-assisted learning tools by teachers and students. 5. Participation Rates - Percentage of teachers involved in mentorship programs.

Strategy	Goals	Operational Approaches	Indicator
			- Percentage of students attending empowerment workshops.
3. Policy and Collaboration-Driven Development Strategy	To align educational policies and strengthen partnerships with stakeholders to establish a cohesive framework that advances sustainable learning and institutional development.	1. Set clear educational goals -Education policies should aim to enhance students' sustainable learning ability, including innovation, critical thinking, self-management and lifelong learning ability, etc. 2. Optimize the curriculum system -Encourage schools to develop interdisciplinary courses to cultivate students' comprehensive literacy and problem-solving abilities. 3. Support personalized learning -Policies should encourage schools to provide diverse learning resources and teaching methods to meet the learning needs of different students 4. Strengthen the partnership between schools and the government, families,	1. Core curriculum standards, forming a complete target system, and establishing an evaluation mechanism. 2. Rationality of curriculum structure, innovation of curriculum content, diversity of teaching methods, proportion of practical courses, etc. 3. Provide diverse learning materials, such as video tutorials, interactive software, practical

Strategy	Goals	Operational Approaches	Indicator
		enterprises and communities -The government should increase investment in education, establish a home-school cooperation mechanism, encourage enterprises to participate in school education activities, use community resources to carry out education activities, etc. 5. Evaluation and feedback -Establish a scientific and reasonable evaluation system to conduct regular evaluations of students' sustainable learning ability.	projects, etc., to meet the learning styles and interests of different students. 4. The amount of government investment and the number of relevant policies formulated. 5. The completeness of the evaluation system and the evaluation cycle.
4. Technology and Resilience Integration Strategy	To incorporate advanced technological tools and build resilience into educational practices, equipping students with the skills needed to adapt to rapidly evolving professional and societal demands.	1. Utilize online education platforms and digital resources -Introduce online education platforms to provide a rich variety of online courses and learning resources, so that students can learn independently according to their interests and needs. 2. Adopt project-based learning and virtual experiments	1. The number of online education platforms and digital resources, such as electronic textbooks, multimedia courseware, virtual experiments, etc. 2. The number of project-

Strategy	Goals	Operational Approaches	Indicator
		-Implement project-based learning to encourage students to complete projects through teamwork, independent exploration, etc., and cultivate innovative thinking and practical ability 3. Apply intelligent learning systems -Use intelligent learning systems, such as adaptive learning platforms, to provide personalized learning paths and resources based on students' learning progress and abilities. Through data analysis, understand students' learning behaviors and results, and provide teaching feedback to teachers to adjust teaching strategies. 4. Integrate resilience training into educational practice -Guide students to recognize their strengths and potential, establish positive self-cognition, cultivate a correct view of frustration, and improve emotional regulation and	based teaching resources developed and the breadth of virtual experiments 3. The intelligence level of the intelligent learning system. 4. The number of times a learning support system is established to provide students with personalized learning guidance and psychological counseling services. 5. The degree to which students accept new things.

Strategy	Goals	Operational Approaches	Indicator
		stress management capabilities 5. Encourage attempts and challenges -Encourage students to try new things and not back down in the face of challenges.	
5. Community-engaged and Innovative Collaboration Strategy	To engage community stakeholders and foster innovative collaborations that integrate real-world experiences into education, ensuring practical applications and sustainable student outcomes.	1. Community Learning Resource Partner Program -Integrate learning resources inside and outside the community to jointly organize community education activities. 2. Strengthen home-school cooperation -Invite parents to participate in the school's educational activities and pay attention to students' learning and growth. 3. Introduce case teaching -Introduce real-world cases in teaching, allowing students to learn and understand knowledge by analyzing cases. 4. Carry out social practice -Organize students to participate in social practice, such as social surveys, volunteer services, etc., so that they can experience social life and	1. Sharing learning resources with the community, such as books, venues, facilities, etc., community education activities, such as lectures, workshops, cultural exhibitions, etc. 2. The number of parent meetings and interviews with parents 3. The number of practical teaching courses and class hours 4. The number of students participating in

Strategy	Goals	Operational Approaches	Indicator
		work environment firsthand. 5. Strengthen internships and training -Cooperate with enterprises to establish internship bases to provide students with internship opportunities and training platforms.	social practice and the length of volunteer service 5. The number of school-enterprise cooperation agreements signed with enterprises and the number of enterprise teachers

By arranging the above strategy table, we can get the educational management strategy diagram for improving the sustainable learning ability of students in higher vocational colleges in Guangdong Province, as shown in Figure 4-1

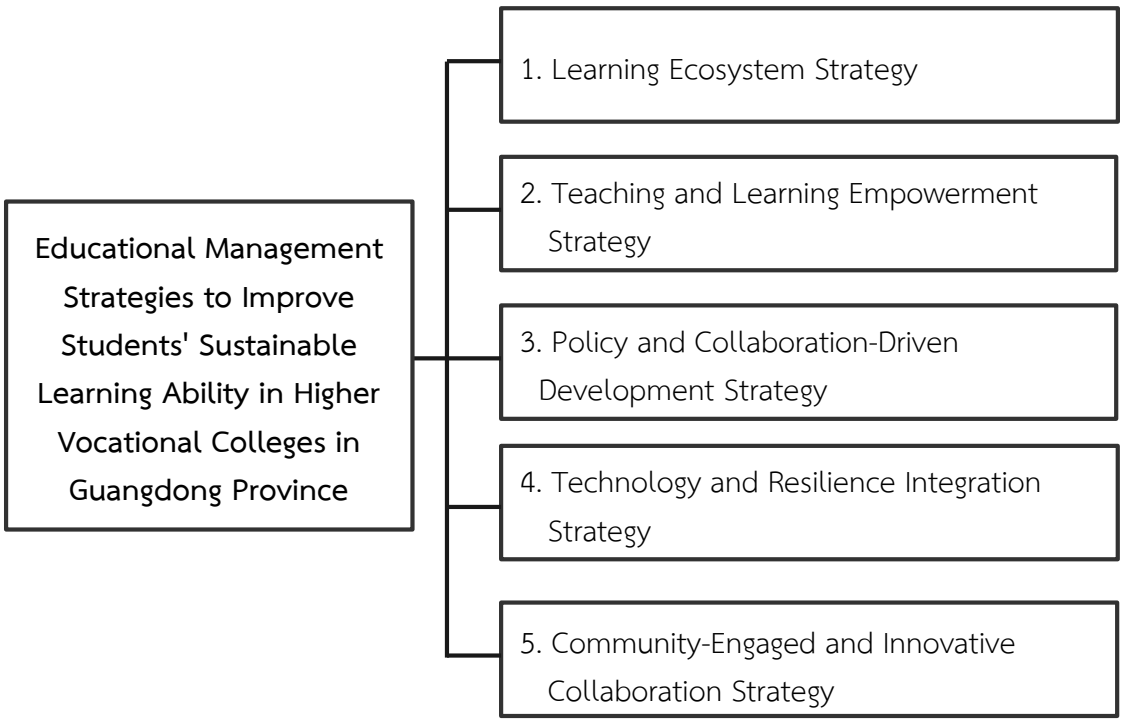

Figure 4.1 Educational Management Strategies to Improve Students' Sustainable Learning Ability in Higher Vocational Colleges in Guangdong Province Figure

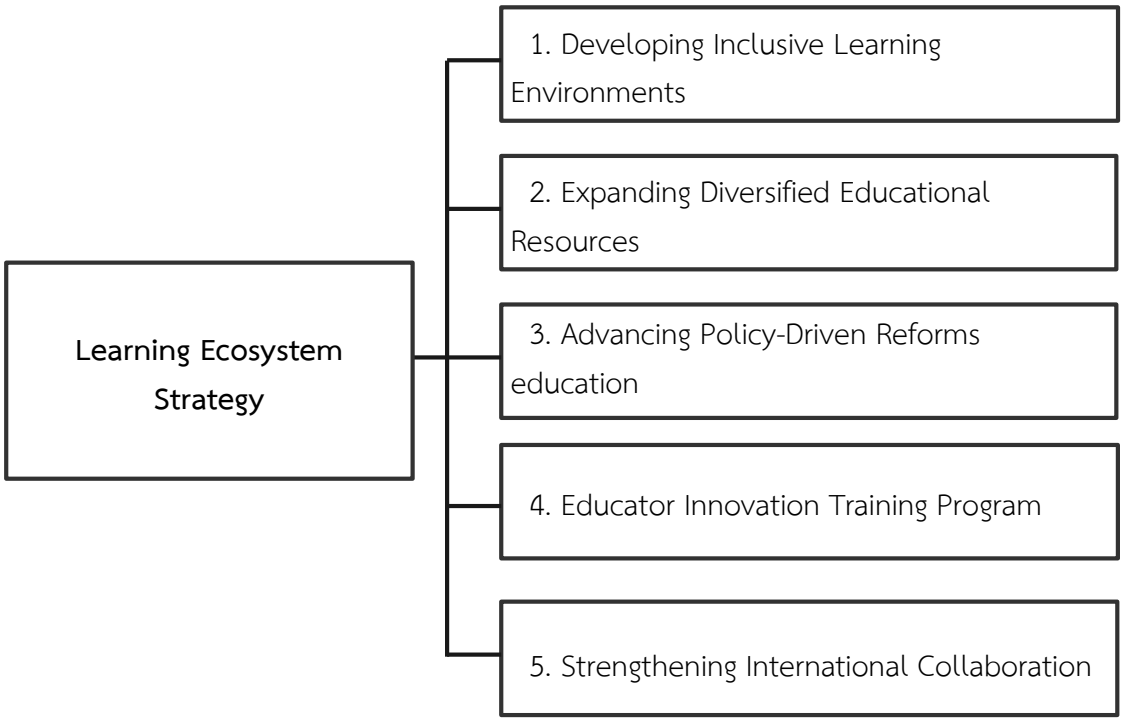

Figure 4.2 Learning Ecosystem Strategy Figure

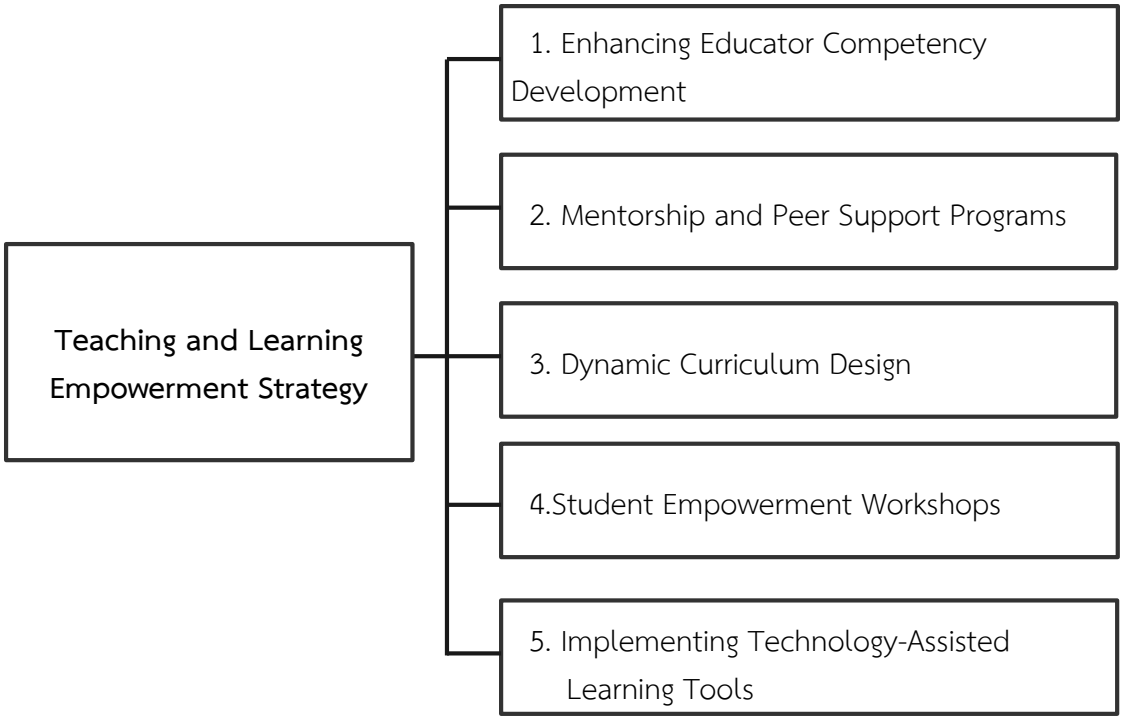

Figure 4.3 Teaching and Learning Empowerment Strategy Figure

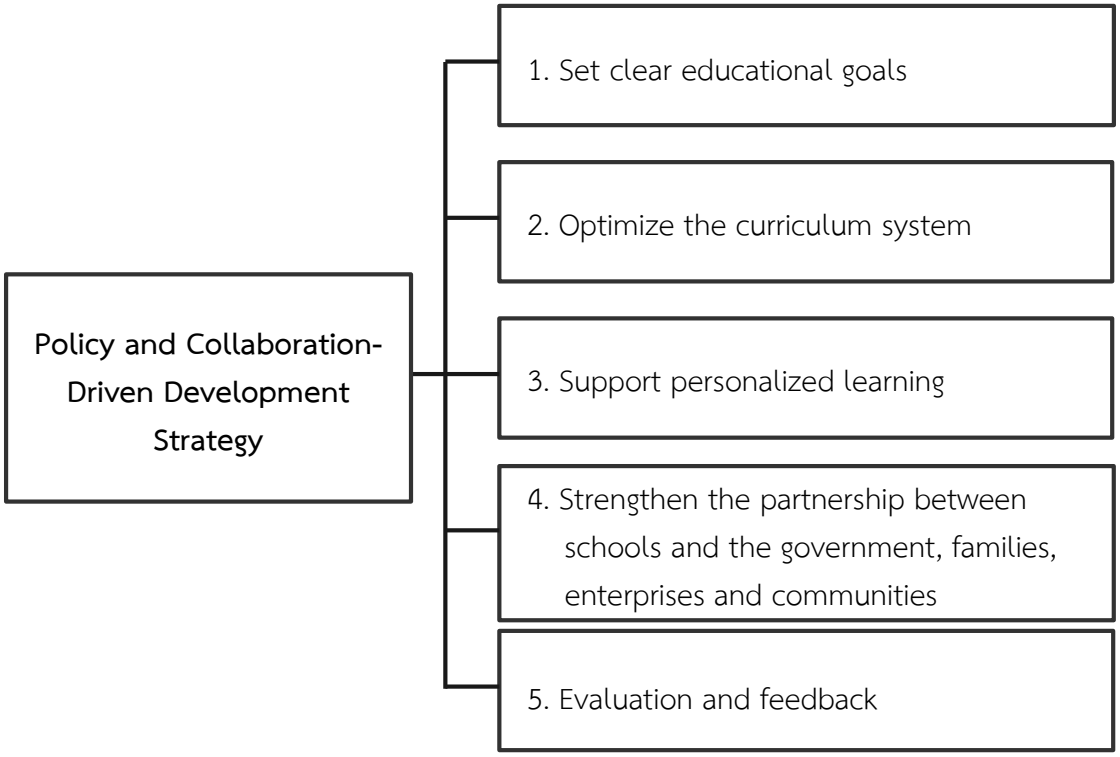

Figure 4.4 Policy and Collaboration-Driven Development Strategy Figure

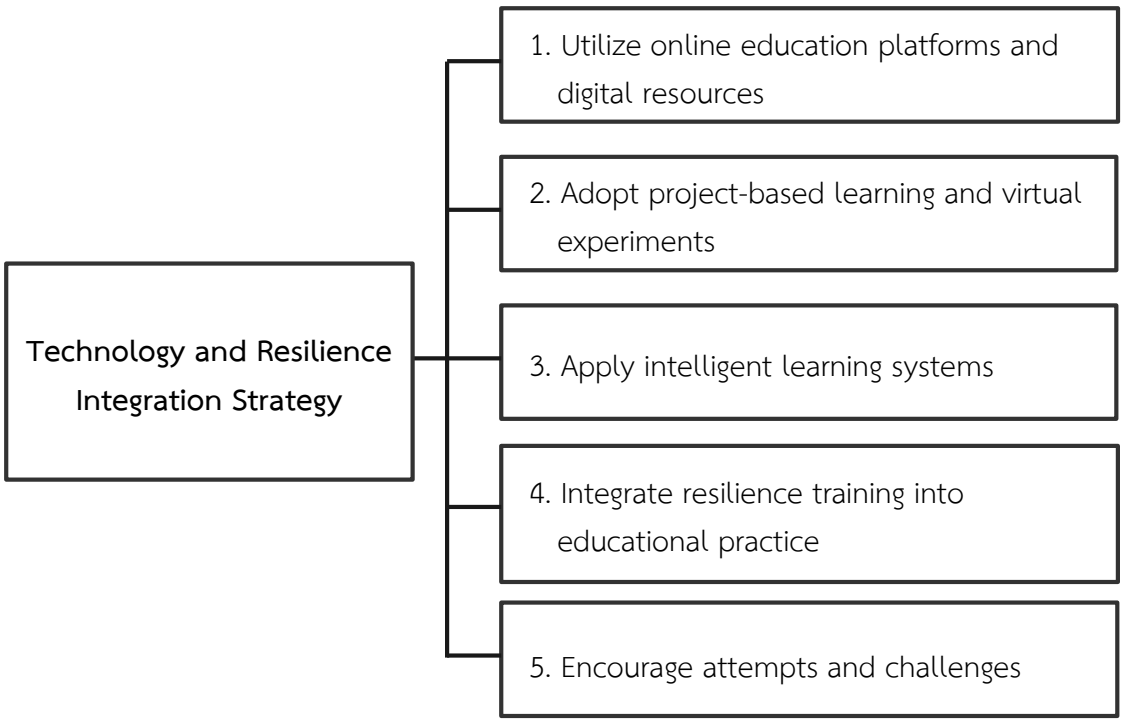

Figure 4.5 Technology and Resilience Integration Strategy Figure

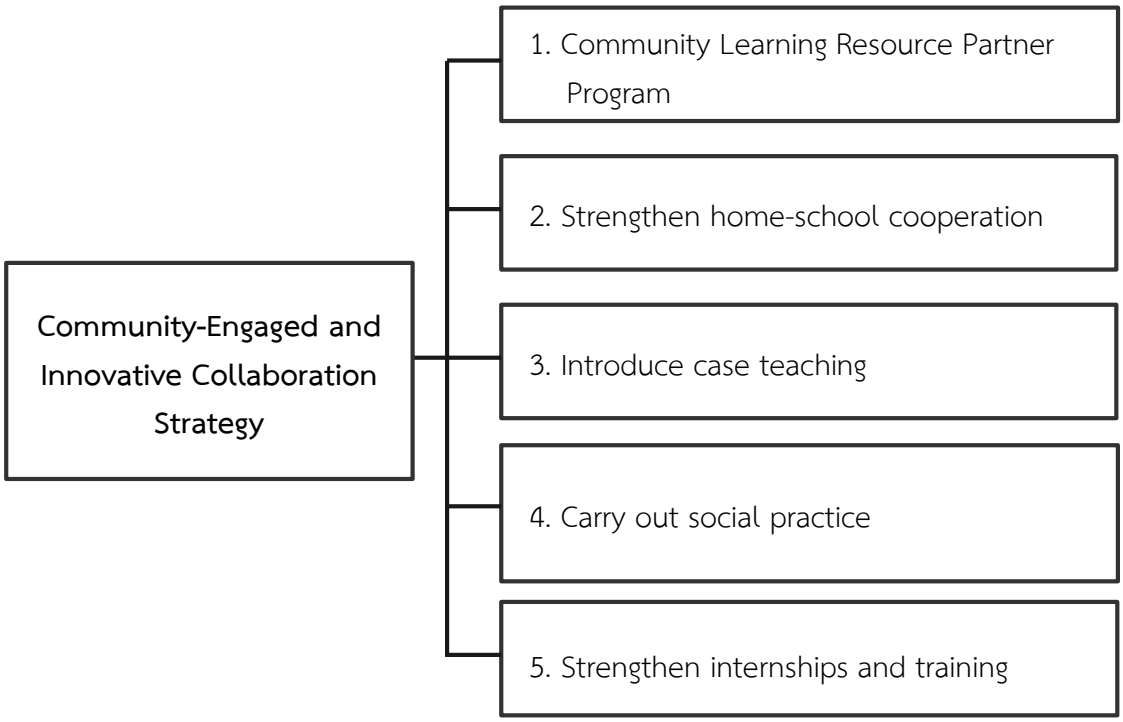

Figure 4.6 Community-Engaged and Innovative Collaboration Strategy Figure

Stage 3: Evaluation of the adaptability and feasibility of the educational management strategies to improve students' sustainable learning ability in higher vocational colleges in Guangdong Province.

In this phase, we present the analysis results of the evaluation of the adaptability and feasibility of Evaluation of the adaptability and feasibility of the educational management strategies to improve students' sustainable learning ability in higher vocational colleges in Guangdong Province. The data is presented in the form of average value and standard deviation.

The analysis results at this stage are led by experts and scholars studying higher education in Guangdong private universities. Five people evaluated the adaptability and feasibility of implementing the strategy. They adopted the form of a 5-level scoring table, namely: highest, high, average, low, and lowest. A respondent can only choose one level. The results are shown in the following table 4.20 -4.21

The educational management strategy for improving students' sustainable learning ability in higher vocational colleges and universities in Guangdong Province is divided into 5 Strategies and contains Proposed Projects to Support the Strategy. A total of 5 experts were invited to evaluate the adaptability and feasibility of the educational management strategies for improving students' sustainable learning ability in higher vocational institutions in Guangdong Province. The data of the analyzed results are expressed in the form of mean and standard deviation, as shown in Table 4.21 – 4.26

Table 4.21 The average value and standard deviation of the evaluation of the Adaptability and feasibility of the educational management strategies to improve students' sustainable learning ability in higher vocational colleges in Guangdong Province. Overall evaluation results.

Educational management strategies to improve students' sustainable learning ability in higher vocational colleges in Guangdong Province.	**adaptability**			**feasibility**		
	$\overline{X}$	**S.D.**	**level**	$\overline{X}$	**S.D.**	**level**
1. Learning Ecosystem Strategy	4.72	0.54	highest	4.56	0.54	highest
2. Teaching and Learning Empowerment Strategy	4.56	0.55	highest	4.60	0.53	highest
3. Policy and Collaboration-Driven Development Strategy	4.52	0.59	highest	4.56	0.68	highest
4. Technology and Resilience Integration Strategy	4.52	0.55	highest	4.64	0.62	highest
5. Community-engaged and Innovative Collaboration Strategy	4.60	0.53	highest	4.68	0.51	highest
Total	**4.58**	**0.55**	**highest**	**4.61**	**0.58**	**highest**

According to Table 4.21, the data show that the experts' overall evaluation of the adaptability and feasibility of the strategy is very high. The overall evaluation of feasibility is the highest ($\overline{X}$ = 4.61), while the overall evaluation of adaptability is also at a very high level ($\overline{X}$ = 4.58), indicating that the strategy demonstrates both high adaptability and feasibility.

The most adaptable strategy for improving students' continuous learning ability in higher vocational colleges in Guangdong Province is: the Learning Ecosystem Strategy ($\overline{X}$ =4.72). The second highest implementation is a community-engaged and Innovative Collaboration Strategy ($\overline{X}$ =4.60). The strategies with the lowest adaptability are: the Technology and Resilience Integration Strategy and Policy and Collaboration-Driven Development Strategy, both ($\overline{X}$ =4.52).

The most feasible strategy for improving students' continuous learning ability in higher vocational colleges in Guangdong Province is the community-engaged and Innovative Collaboration Strategy ($\overline{X}$ =4.68). The second most implemented aspect is: the Technology and Resilience Integration Strategy ($\overline{X}$ =4.64). The strategies with the lowest adaptability are: the Learning Ecosystem Strategy and Policy and Collaboration-Driven Development Strategy, both ($\overline{X}$ =4.56).

Table 4.22 The average value and standard deviation of the evaluation of the adaptability and feasibility of the educational management strategies to improve students' sustainable learning ability in higher vocational colleges in Guangdong Province. Evaluation Results in Learning Ecosystem Strategy:

Learning Ecosystem Strategy	adaptability			feasibility		
	$\overline{X}$	S.D.	level	$\overline{X}$	S.D.	level
1. Developing Inclusive Learning Environments	4.80	0.55	highest	4.60	0.55	highest
2. Expanding Diversified Educational Resources	4.60	0.71	highest	4.40	0.71	high
3. Advancing Policy-Driven Reforms	4.80	0.45	highest	4.80	0.45	highest
4. Educator Innovation Training Program	4.60	0.45	highest	4.60	0.45	highest
5. Strengthening International Collaboration	4.80	0.55	highest	4.40	0.55	high
Total aspects 1	**4.72**	**0.54**	**highest**	**4.56**	**0.54**	**highest**

According to Table 4.22, the experts gave high overall evaluations on the adaptability and feasibility of the Learning Ecosystem Strategy, among which the overall evaluation of feasibility was the highest ($\overline{X}$ =4.56), and the overall evaluation of adaptability was also at a very high level ($\overline{X}$ =4.72), indicating that the strategy has both high adaptability and high feasibility.

The strategy with the highest adaptability of the Learning Ecosystem Strategy is: Developing Inclusive Learning Environments and Advancing Policy-Driven Reforms, both of which are ($\overline{X}$ =4.80), and the adaptability of the other strategies is ($\overline{X}$ =4.60). The strategy with the highest feasibility of the Learning Ecosystem Strategy is: Advancing Policy-Driven Reforms ($\overline{X}$ =4.80). The strategy with the lowest feasibility is: Expanding Diversified Educational Resources and Strengthening International Collaboration, both of which are ($\overline{X}$ =4.56).

Table 4.23 The average value and standard deviation of the evaluation of the adaptability and feasibility of the educational management strategies to improve students' sustainable learning ability in higher vocational colleges in Guangdong Province. Evaluation results in Teaching and Learning Empowerment Strategy:

Teaching and Learning Empowerment Strategy	adaptability			feasibility		
	$\overline{X}$	S.D.	level	$\overline{X}$	S.D.	level
1. Enhancing Educator Competency Development	4.20	0.84	high	4.60	0.55	highest
2. Mentorship and Peer Support Programs	4.60	0.55	highest	4.40	0.55	high
3. Dynamic Curriculum Design	4.80	0.45	highest	4.60	0.55	highest
4. Student Empowerment Workshops	4.40	0.45	high	4.60	0.55	highest
5. Implementing Technology-Assisted Learning Tools	4.80	0.45	highest	4.80	0.45	highest
Total aspects 2	**4.56**	**0.55**	**highest**	**4.60**	**0.53**	**highest**

According to Table 4.23, the experts' overall evaluation of the adaptability and feasibility of the Teaching and Learning Empowerment Strategy is very high, among which the overall evaluation of feasibility is the highest ($\overline{X}$ =4.60), and the overall evaluation of adaptability is also at a very high level ($\overline{X}$ =4.56), indicating that the strategy has both high adaptability and high feasibility.

The strategy with the highest adaptability of the Teaching and Learning Empowerment Strategy is: Dynamic Curriculum Design and Implementing Technology-Assisted Learning Tools, both ($\overline{X}$ =4.80), and the strategy with the lowest adaptability is Enhancing Educator Competency Development ($\overline{X}$ =4.20). The strategy with the highest feasibility of the Teaching and Learning Empowerment Strategy is: Implementing Technology-Assisted Learning Tools ($\overline{X}$ =4.80). The strategy with the lowest feasibility is: Mentorship and Peer Support Programs ($\overline{X}$ =4.40).

Table 4.24 The average value and standard deviation of the evaluation of the adaptability and feasibility of the educational management strategies to improve students' sustainable learning ability in higher vocational colleges in Guangdong Province. Evaluation results in Policy and Collaboration-Driven Development Strategy:

Policy and Collaboration-Driven Development Strategy	adaptability			feasibility		
	$\overline{X}$	S.D.	level	$\overline{X}$	S.D.	level
1. Set clear educational goals	4.60	0.55	highest	4.60	0.55	highest
2. Optimize the curriculum system	4.40	high	highest	4.80	0.89	highest
3. Support personalized learning	4.60	0.55	highest	4.40	0.55	high
4. Strengthen the partnership between schools and the government, families, enterprises and communities	4.80	0.45	highest	4.60	0.55	highest
5. Evaluation and feedback	4.20	0.84	high	4.40	0.84	high
Total aspects 3	**4.52**	**0.59**	**highest**	**4.56**	**0.68**	**highest**

According to Table 4.24, the experts gave high overall evaluations on the adaptability and feasibility of the Policy and Collaboration-Driven Development Strategy, among which the overall evaluation of feasibility was the highest ($\overline{X}$ =4.56), and the overall evaluation of adaptability was also at a very high level ($\overline{X}$ =4.52), indicating that the strategy has both high adaptability and high feasibility.

The most adaptable strategy of the Policy and Collaboration-Driven Development Strategy is to strengthen the partnership between schools and the government, families, enterprises, and communities ($\overline{X}$ =4.80), and the least adaptable strategy is Evaluation and feedback ($\overline{X}$ =4.20). The most feasible strategy of the Policy and Collaboration-Driven Development Strategy is to optimize the curriculum system ($\overline{X}$ =4.80). The least feasible strategy is to support personalized learning and Evaluation and feedback, both ($\overline{X}$ =4.40).

Table 4.25 The average value and standard deviation of the evaluation of the adaptability and feasibility of the educational management strategies to improve students' sustainable learning ability in higher vocational colleges in Guangdong Province. Evaluation Results in Technology and Resilience Integration Strategy:

Technology and Resilience Integration Strategy	adaptability			feasibility		
	$\overline{X}$	S.D.	level	$\overline{X}$	S.D.	level
1. Utilize online education platforms and digital resources	4.40	0.55	high	4.60	0.71	highest
2. Adopt project-based learning and virtual experiments	4.60	0.55	highest	4.80	0.84	highest
3. Apply intelligent learning systems	4.60	0.55	highest	4.60	0.55	highest
4. Integrate resilience training into educational practice	4.60	0.55	highest	4.40	0.55	high
5. Encourage attempts and challenges	4.40	0.55	high	4.80	0.45	highest
Total aspects 4	**4.52**	**0.55**	**highest**	**4.64**	**0.62**	**highest**

According to Table 4.24, the experts' overall evaluation of the adaptability and feasibility of the Technology and Resilience Integration Strategy is very high, among which the overall evaluation of feasibility is the highest ($\overline{X}$ =4.64), and the overall evaluation of adaptability is also at a very high level ($\overline{X}$ =4.52), indicating that the strategy has both high adaptability and high feasibility.

The adaptability of the Technology and Resilience Integration Strategy is very high, among which Adopts project-based learning and virtual experiments, Apply intelligent learning systems, and Integrate resilience training into educational practice, all three have ($\overline{X}$ =4.60), and the adaptability of the remaining strategies is ($\overline{X}$ =4.40). The most feasible strategy of the Technology and Resilience Integration Strategy is to adopt project-based learning and virtual experiments and Encourage attempts and challenges have both ($\overline{X}$ =4.80). The least feasible strategy is to integrate resilience training into educational practice ($\overline{X}$ =4.40).

Table 4.26 The average value and standard deviation of the evaluation of the adaptability and feasibility of the educational management strategies to improve students' sustainable learning ability in higher vocational colleges in Guangdong Province. Evaluation Results in Community-Engaged and Innovative Collaboration Strategy:

Community-engaged and Innovative Collaboration Strategy	adaptability			feasibility		
	$\overline{X}$	S.D.	level	$\overline{X}$	S.D.	level
1. Community Learning Resource Partner Program	4.80	0.45	highest	4.80	0.45	highest
2. Strengthen home-school cooperation	4.60	0.55	highest	4.60	0.55	highest
3. Introduce case teaching	4.60	0.55	highest	4.60	0.55	highest
4. Carry out social practice	4.40	0.55	high	4.80	0.45	highest
5. Strengthen internships and training	4.60	0.55	highest	4.60	0.55	highest
Total aspects 5	**4.60**	**0.53**	**highest**	**4.68**	**0.51**	**highest**

According to Table 4.26, the experts' overall evaluation of the adaptability and feasibility of the Community-Engaged and Innovative Collaboration Strategy is very high, among which the overall evaluation of feasibility is the highest ($\overline{X}$ =4.68), and the overall evaluation of adaptability is also at a very high level ($\overline{X}$ =4.60), indicating that the strategy has both high adaptability and high feasibility.

The strategy with the highest adaptability of the Community-Engaged and Innovative Collaboration Strategy is the community Learning Resource Partner Program ($\overline{X}$ =4.80), and the strategy with the lowest adaptability is Carrying out social practice ($\overline{X}$ =4.40). The strategy with the highest feasibility of the Community-Engaged and Innovative Collaboration Strategy is the community Learning Resource Partner Program and Carrying out social practice, both of which are available (=4.80). The feasibility of the remaining strategies is (=4.60).

Chapter 5
Discussion Conclusion and Recommendations

The research on the educational management strategies to improve students' sustainable learning ability in higher vocational colleges in Guangdong Province. The objectives of this research were: 1) To examine the current and expected situations regarding students' sustainable learning ability in higher vocational colleges in Guangdong Province; 2) To develop educational management strategies to improve the students' sustainable learning ability in higher vocational colleges in Guangdong Province. Moreover, 3) To evaluate the adaptability and feasibility of the educational management strategies to improve the students' sustainable learning ability in higher vocational colleges in Guangdong Province. These include 3 following aspects: 1) School environment factors, 2) teacher factors, and 3) student factors.

The sample group of this research consisted of 384 students in the academic year 2024. The sample size was determined by applying the Krejcie and Morgan table, which was selected through multi-stage random sampling. The informants were selected from the top schools among the higher vocational colleges for questionnaires, 8 experts for interview, 12 experts for focus group discussion, and 5 experts for strategies evaluation. The research instruments included 1) questionnaires, 2) interviews, 3) strategies, and 4) evaluation forms. The data analysis statistics were percentages, mean, standard deviations, Modified Priority Needs Index ($PNI_{modified}$), and content analysis. The conclusion, discussion, and recommendations of this research are as follows:

Conclusion

The research on the educational management strategies to improve students' sustainable learning ability in higher vocational colleges in Guangdong Province. The researcher summarizes the conclusion into 3 Stages, details as follows:

Stage 1: Results of examining the current and expected situations of students' sustainable learning ability in higher vocational colleges in Guangdong Province

Stage 2: Results of developing the educational management strategies to improve students' sustainable learning ability in higher vocational colleges in Guangdong Province

Stage 3: Results of evaluating the adaptability and feasibility of educational management strategies to improve students' sustainable learning ability in higher

vocational colleges in Guangdong Province

Stage 1: Results of Examining the Current and Expected Situations of Students' Sustainable Learning Ability in Higher Vocational Colleges in Guangdong Province

Three key factors influence the sustainable learning ability of students in higher vocational colleges in Guangdong Province: school environment, teacher, and student factors.

1. Overall, The current situation of these abilities was rated as high, with an overall mean score of 3.69. Among the factors, the school environment had the highest mean score (3.77), while student factors had the lowest (3.64).

In the expected situations, the sustainable learning ability was rated higher, with an overall mean score of 4.52. The school environment again scored the highest (4.53), followed by teacher and student factors, with a mean score of 4.51.

2. School environment factors: The current situation of students' sustainable learning abilities in higher vocational colleges in Guangdong Province, under school environment factors, was rated high overall ($\overline{X}$ = 3.77, S.D. = 0.62). The highest-rated aspect was providing diverse learning resources and tools ($\overline{X}$ = 3.87, S.D. = 0.93), followed by connecting learning content with real life ($\overline{X}$ = 3.83, S.D. = 0.92), providing autonomous learning spaces ($\overline{X}$ = 3.80, S.D. = 0.83), and integrating autonomous learning concepts into school culture ($\overline{X}$ = 3.80, S.D. = 0.86).

In expected situations, school environment factors were rated at the highest level overall ($\overline{X}$ = 4.53, S.D. = 0.48). The top-rated expectation was providing autonomous learning spaces ($\overline{X}$ = 4.58, S.D. = 0.73), followed by designing open-ended courses ($\overline{X}$ = 4.55, S.D. = 0.70), providing diverse learning resources ($\overline{X}$ = 4.54, S.D. = 0.74), and integrating autonomous learning concepts ($\overline{X}$ = 4.54, S.D. = 0.71).

3. Teacher factors: The current situations were rated high overall ($\overline{X}$ = 3.67, S.D. = 0.64). The highest-rated aspect was that teachers should encourage students to learn, communicate, and cooperate, establishing a safe, trusted, and respectful teacher-student relationship. ($\overline{X}$ = 3.76, S.D. = 0.86). Other highly rated aspects included diverse evaluation methods ($\overline{X}$ = 3.73, S.D. = 0.92), timely feedback ($\overline{X}$ = 3.73, S.D. = 0.83), attention to the learning process ($\overline{X}$ = 3.70, S.D. = 0.90), and strengthening independent learning theory and methods ($\overline{X}$ = 3.70, S.D. = 0.82).

Expected Situations: Teacher factors were rated at the highest level overall ($\overline{X}$ = 4.51, S.D. = 0.52). The most anticipated aspect was "Teachers should strengthen independent learning theory, improve teaching methods, and guide students toward independent learning" ($\overline{X}$ = 4.57, S.D. = 0.69). Other expectations included encouraging

creativity and exploration ($\overline{X}$ = 4.55, S.D. = 0.72) and fostering communication and cooperation between teachers and students ($\overline{X}$ = 4.54, S.D. = 0.68).

4. Student factors: The Current Situations were rated high overall ($\overline{X}$ = 3.73, S.D. = 0.79). The highest-rated aspect was the ability to retrieve, screen, and judge information ($\overline{X}$ = 3.73, S.D. = 0.79), followed by self-motivation and self-management with positive learning habits ($\overline{X}$ = 3.70, S.D. = 0.80).

Expected Situations: Student factors were rated at the highest level overall ($\overline{X}$ = 4.51, S.D. = 0.43). The most anticipated aspect was improving information retrieval and judgment skills ($\overline{X}$ = 4.58, S.D. = 0.66), followed by self-motivation and self-management ($\overline{X}$ = 4.56, S.D. = 0.70) and efficient time management to avoid procrastination ($\overline{X}$ = 4.51, S.D. = 0.72).

Stage 2: Results of developing the educational management strategies to improve students' sustainable learning ability in higher vocational colleges in Guangdong Province

Step 1 Analysis of Needs, Strengths, Weaknesses, Opportunities, and Threats for developing students' sustainable learning ability in higher vocational colleges in Guangdong Province

Results of the Analysis of Needs, Strengths, Weaknesses, Opportunities, and Threats for developing students' sustainable learning ability in higher vocational colleges in Guangdong Province

1. Overall:

The Modified Priority Needs Index ($PNI_{Modified}$) for this ability was calculated as 0.22. Student factors showed the highest $PNI_{Modified}$ value (0.24), followed by teacher factors (0.23) and school environment factors (0.20).

These findings identify student and teacher factors as weaknesses requiring strategic improvement, while the school environment is recognized as a strength to be reinforced. The results provide essential insights for drafting educational management strategies aimed at enhancing students' sustainable learning ability in higher vocational colleges in Guangdong Province.

2. School environment factors:

The prioritization of needs showed the highest urgency for integrating community learning resources ($PNI_{Modified}$= 0.24), followed by working with parents to cultivate autonomous learning ($PNI_{Modified}$= 0.22), providing autonomous learning spaces ($PNI_{Modified}$= 0.21), and guiding parents to encourage independent learning ($PNI_{Modified}$= 0.21).

3. Teacher factors:

Prioritization of Needs: The most urgent development needs, based on the $PNI_{Modified}$ values (0.21–0.25), included Adopting varied teaching modes such as flipped classrooms and blended teaching to enhance students' interest and independent learning abilities ($PNI_{Modified}$ = 0.25), and Strengthening team collaboration among teachers to explore and implement effective strategies for fostering independent learning ($PNI_{Modified}$ = 0.25). Organizing field trips to integrate theoretical knowledge with practice ($PNI_{Modified}$ = 0.24).

4. Student factors:

Prioritization of Needs: The most urgent development need was for students to overcome learning difficulties, seek help, and improve their abilities ($PNI_{Modified}$ = 0.26). Other priorities included learning from mistakes ($PNI_{Modified}$ = 0.25), time management ($PNI_{Modified}$ = 0.24), and setting clear goals with actionable plans ($PNI_{Modified}$ = 0.24).

Step 2 Drafting the Development of Strategies for Improving Students' Sustainable Learning Ability in Higher Vocational Colleges in Guangdong Province using the SWOT/TOWS Matrix Technique

the draft educational management strategies to improve students' sustainable learning ability in higher vocational colleges in Guangdong Province includes the following:

Proactive Strategies (SO): A combination of Strengths (S) and Opportunities (O), comprising 3 strategies: 1) Innovative Learning Ecosystem Strategy, 2) Empowered Teaching and Learning Strategy, 3) Policy-Driven Critical Thinking Development Strategy, and 4 proposed projects to support the strategies.

Corrective Strategies (WO): A combination of Weaknesses (W) and Opportunities (O), comprising 3 strategies: 1) Collaborative Vocational Education Enhancement Strategy, 2) Integrated Teaching and Policy Advancement Strategy,
3) Technology-Driven Resilience Enhancement Strategy, and 4 proposed projects to support the strategies.

Preventive Strategies (ST): A combination of Strengths (S) and Threats (T), comprising 3 strategies: 1. Future-Ready Learning Ecosystem Strategy, 2) Resilient Teaching and Feedback Strategy, 3) Dynamic Teaching and Feedback Strategy, and 4 proposed projects to support the strategies.

Defensive Strategies (WT): A combination of Weaknesses (W) and Threats (T), comprising 3 strategies: 1) Community-Engaged Education Enhancement Strategy,
2) Resilient Teaching and Feedback Strategy, 3) Dynamic Teaching and Feedback

Strategy, and 4 proposed projects to support the strategies.

Step 3 Develop educational management strategies to improve students' sustainable learning ability in higher vocational colleges in Guangdong Province

The results of the development and validation of educational management strategies to improve students' sustainable learning abilities in higher vocational colleges in Guangdong Province, as evaluated by twelve experts through a focus group discussion, revealed the following:

The educational management strategies are designed to improve students' sustainable learning abilities in higher vocational colleges in Guangdong Province.

They consist of:

Vision :

Empowering students’ sustainable learning abilities and professional growth through innovation, collaboration, resilience, and community-driven education in Guangdong’s higher vocational colleges.

Five Missions:

1. Create an inclusive and adaptive educational environment that fosters innovation and supports sustainable learning for all students.

2. Enhance the capacity of educators and students through targeted training, feedback mechanisms, and dynamic teaching methods to promote independent and lifelong learning.

3. Strengthen the alignment of educational policies and partnerships to create a cohesive framework for advancing sustainable learning practices.

4. Leverage advanced technology and build resilience into educational practices to prepare students for evolving professional and societal demands.

5. Foster collaboration with community stakeholders to develop innovative programs that integrate real-world applications into the learning process, promoting sustainable outcomes.

Five Goal:

1. To create an inclusive, supportive, and adaptive educational environment that fosters innovation and promotes sustainable learning practices for students.

2. To enhance educators' skills, knowledge, and teaching methodologies while empowering students to engage in independent, critical, and lifelong learning.

3. To align educational policies and strengthen partnerships with stakeholders to establish a cohesive framework that advances sustainable learning and institutional development.

4. To incorporate advanced technological tools and build resilience into

educational practices, equipping students with the skills to adapt to rapidly evolving professional and societal demands.

5. To engage community stakeholders and foster innovative collaborations that integrate real-world experiences into education, ensuring practical applications and sustainable student outcomes.

Five Core Strategies

1. Learning Ecosystem Strategy
2. Teaching and Learning Empowerment Strategy
3. Policy and Collaboration-Driven Development Strategy
4. Technology and Resilience Integration Strategy
5. Community-engaged and Innovative Collaboration Strategy

These elements reflect a comprehensive framework to guide the sustainable improvement of students' learning ability.

Twenty-five Operational Approaches

1. Learning Ecosystem Strategy

1.1 Developing Inclusive Learning Environments
1.2 Expanding Diversified Educational Resources
1.3 Advancing Policy-Driven Reforms
1.4 Educator Innovation Training Program
1.5 Strengthening International Collaboration

2. Teaching and Learning Empowerment Strategy

2.1 Enhancing Educator Competency Development
2.2 Mentorship and Peer Support Programs
2.3 Dynamic Curriculum Design
2.4 Student Empowerment Workshops
2.5 Implementing Technology-Assisted Learning Tools

3. Policy and Collaboration-Driven Development Strategy

3.1 Set clear educational goals
3.2 Optimize the curriculum system
3.3 Support personalized learning
3.4 Strengthen the partnership between schools and the government, families, enterprises and communities
3.5 Evaluation and feedback

4. Technology and Resilience Integration Strategy

4.1 Utilize online education platforms and digital resources
4.2 Adopt project-based learning and virtual experiments

4.3 Apply intelligent learning systems

4.4 Integrate resilience training into educational practice

4.5 Encourage attempts and challenges

5. Community-engaged and Innovative Collaboration Strategy

5.1 Community Learning Resource Partner Program

5.2 Strengthen home-school cooperation

5.3 Introduce case teaching

5.4 Carry out social practice

5.5 Strengthen internships and training

Stage 3: Results of evaluating the adaptability and feasibility of educational management strategies to improve students' sustainable learning ability in higher vocational colleges in Guangdong Province

The adaptability and feasibility of educational management strategies to improve students' sustainable learning ability in higher vocational colleges in Guangdong Province in 5 aspects were at the highest level with values between 4.00 and 5.00, which means improve students' sustainable learning ability in higher vocational colleges in Guangdong Province are adaptability and feasibility**.** Details were as follows:

The experts' overall evaluation of the adaptability and feasibility of the strategy is very high. The general assessment of feasibility is the highest ($\overline{X}$ = 4.61), while the overall evaluation of adaptability is also very high ($\overline{X}$ = 4.58), indicating that the strategy demonstrates both high adaptability and feasibility.

The adaptability and feasibility of the Learning Ecosystem Strategy were 4.72 and 4.56, at the highest levels.

The adaptability and feasibility of the Teaching and Learning Empowerment Strategy were 4.56 and 4.60, at the highest levels.

The adaptability and feasibility of the Policy and Collaboration-Driven Development Strategy were 4.52 and 4.56, the highest level.

The adaptability and feasibility of the Technology and Resilience Integration Strategy were 4.52 and 4.64, at the highest level.

The adaptability and feasibility of the Community-Engaged and Innovative Collaboration Strategy were 4.60 and 4.68, the highest level.

Discussion

The research on the educational management strategies to improve students' sustainable learning ability in higher vocational colleges in Guangdong Province. The researcher summarizes the conclusion into 3 Phases, details as follows:

Stage 1: The current and expected situations of students' sustainable learning ability in higher vocational colleges in Guangdong Province

Stage 2: The developing the educational management strategies to improve students' sustainable learning ability in higher vocational colleges in Guangdong Province

Stage 3: The adaptability and feasibility of educational management strategies to improve students' sustainable learning ability in higher vocational colleges in Guangdong Province

Stage 1: The current and expected situations of students' sustainable learning ability in higher vocational colleges in Guangdong Province

The results of the Current and expected situation of students' sustainable learning ability in higher vocational colleges in Guangdong Province. Discussed as follows:

1. Students' sustainable learning ability in higher vocational colleges in Guangdong Province can be categorized into three main components: school environment factors**,** teacher factors**,** and student factors**.** School Environment: A supportive institutional setting with appropriate infrastructure, resources, and curricula fosters critical thinking and lifelong learning. Teachers: Educators play a vital role in guiding and motivating students while developing their cognitive and problem-solving skills, essential for independent learning (Zimmerman, 2002). Students: Learners' self-regulation, intrinsic motivation, and metacognitive skills are crucial for long-term learning (Pintrich, 2000). These factors collectively shape students' capacity for continuous, self-directed learning.

2. School environment factors: The study revealed that school environment factors play a significant role in fostering sustainable learning. These factors received a high rating in current and expected situations, with a Modified Priority Needs Index ($PNI_{Modified}$) of 0.20, slightly below the overall average (0.22). Key strengths include the availability of diverse learning resources such as libraries, networks, online platforms, and field trips, which align with the findings of Kim et al. (2019) that emphasize the importance of varied resources in creating an inclusive learning environment. Similarly, Zhang and Li (2020) highlight the benefits of integrating multiple learning modalities to enhance student engagement. However, the study

identified a significant gap in utilizing community-based learning resources**,** a critical area for development. Liu et al. (2018) suggest that leveraging local community partnerships could provide practical exposure and bridge the gap between classroom knowledge and real-world applications.

The results of this study are guidelines for developing strategies to develop students' sustainable learning abilities as follows: 1) Strengthen Community Partnerships: Schools should collaborate with local businesses, cultural institutions, and NGOs to integrate community resources into the curriculum. 2) Enhance Internal Resources: Continuous improvement of internal resources should be accompanied by fostering a culture of external engagement to provide holistic learning experiences. 3) Focus on Applied Learning: Encourage using real-world contexts to improve students' ability to apply knowledge effectively.

3. Teacher Factors: Teacher factors are a critical weakness in enhancing students' sustainable learning ability in higher vocational colleges in Guangdong Province. Although rated highly in the current evaluation, the Priority Needs Index ($PNI_{Modified}$ = 0.23) reveals a significant gap compared to the overall average ($PNI_{Modified}$ = 0.22), indicating urgent attention areas. Key weaknesses include the limited adoption of diverse teaching strategies, such as flipped classrooms and blended learning, and insufficient team cooperation among teachers. In contrast, notable strengths involve using varied evaluation methods, timely feedback, and fostering safe and respectful teacher-student relationships, all of which significantly contribute to a positive learning environment. These findings align with prior studies, such as Li and Wang (2021), who emphasized the role of innovative teaching strategies in improving student engagement and autonomy. Similarly, Johnson and Taylor (2020) highlighted the importance of teacher collaboration and diverse teaching approaches in fostering self-directed learning.

The results of this study are guidelines for developing strategies to develop students' sustainable learning abilities as follows: 1) Professional Development Programs: Focus on equipping teachers with innovative strategies, mainly flipped classrooms and blended learning models. 2) Promoting Collaboration: Organize team-building workshops and collaborative training to strengthen teacher cooperation. 3) Leveraging Strengths: Utilize existing strengths, such as diverse evaluation methods and feedback practices, to support sustainable learning effectively.

4. Student Factors: Student factors were identified as the most significant weakness influencing sustainable learning ability in higher vocational colleges in Guangdong Province despite being rated high in the current state and very high in the

expected state. The Priority Needs Index ($PNI_{Modified}$ = 0.24) was higher than those for school environment and teacher factors, highlighting its critical importance. The weakest aspect is students' ability to overcome challenges, persevere, seek help, and continuously improve. Conversely, their most substantial area is the ability to think independently, question critically, and form their judgments. These findings align with Johnson and Lee (2019), who emphasized resilience as essential for navigating academic challenges, and Brown et al. (2020), who highlighted the role of critical thinking and self-reflection in academic success.

The results of this study are guidelines for developing strategies to develop students' sustainable learning abilities as follows: 1) Resilience Development Programs: Offer workshops to enhance emotional resilience and perseverance in students. 2) Peer Mentoring Systems: Establish peer-led initiatives to encourage help-seeking behaviors and mutual support. 3) Promote Critical Thinking: Integrate activities that foster independent thinking and critical analysis into the curriculum. 4) Personalized Feedback: Provide regular, constructive feedback to guide students' self-improvement efforts.

Stage 2: The developing the educational management strategies to improve students' sustainable learning ability in higher vocational colleges in Guangdong Province

The educational management strategies are designed to improve students' sustainable learning abilities in higher vocational colleges in Guangdong Province.

They consist of:

Vision: Empowering students' sustainable learning abilities and professional growth through innovation, collaboration, resilience, and community-driven education in Guangdong's higher vocational colleges. 5 Mission, 5 Goals, and 5 Core Strategies:

1) Learning Ecosystem Strategy, 2) Teaching and Learning Empowerment Strategy, 3) Policy and Collaboration-Driven Development Strategy, 4) Technology and Resilience Integration Strategy, and 5) Community-Engaged and Innovative Collaboration Strategy

Developing educational management strategies to improve students' sustainable learning ability in higher vocational colleges in Guangdong Province has resulted in five integrated strategies that align with contemporary educational challenges and opportunities. These strategies emphasize innovation, resilience, collaboration, and community engagement, reflecting both theoretical foundations and practical implications.

Learning Ecosystem Strategy: This strategy integrates the Innovative Learning Ecosystem Strategy (SO) and Future-Ready Learning Ecosystem Strategy (ST) to create an inclusive and adaptive learning environment. It supports sustainable learning by fostering innovation and preparing students for future professional demands. This approach aligns with the findings of Xie et al. (2021), who highlighted that a dynamic and inclusive learning ecosystem enhances students' engagement and long-term learning outcomes.

Teaching and Learning Empowerment Strategy: This strategy combines the Empowered Teaching and Learning Strategy (SO), Resilient Teaching and Feedback Strategy (ST), and Dynamic Teaching and Feedback Strategy (ST). It aims to empower educators and students through innovative pedagogical approaches and constructive feedback. Such practices are essential for fostering independent learning and resilience, as noted by Cheng et al. (2019), who emphasized the role of empowerment in promoting lifelong learning skills in vocational education.

Policy and Collaboration-Driven Development Strategy: By merging the Policy-Driven Critical Thinking Development Strategy (SO), Integrated Teaching and Policy Advancement Strategy (WO), and Collaborative Vocational Education Enhancement Strategy (WO), this strategy ensures alignment between institutional policies and sustainable learning practices. It underscores the importance of collaboration, as shown by Li and Zhang (2020), in facilitating critical thinking and innovative teaching practices in vocational settings.

Technology and Resilience Integration Strategy: This strategy combines the Technology-Driven Resilience Enhancement Strategy (WO) and Resilience and Market-Ready Learning Strategy (WT) and leverages advanced technology to prepare students for an evolving professional landscape. Integrating resilience into teaching practices mirrors the conclusions of Zhao et al. (2020), who found that technological adaptability is critical for sustainable learning in higher education.

Community-Engaged and Innovative Collaboration Strategy: Integrating the Community-Engaged Education Enhancement Strategy (WT) and Innovative Teaching and Collaboration Strategy (WT), this strategy emphasizes the role of community engagement and collaborative initiatives in fostering practical and sustainable learning outcomes. This perspective is supported by Huang et al. (2018), who argued that community-based learning enhances students’ problem-solving skills and social responsibility.

Implications: These strategies contribute to students' sustainable learning by addressing critical areas of need in vocational education. They collectively promote a

holistic educational experience that aligns with contemporary demands for innovation, adaptability, and collaborative learning environments. The integration of these strategies demonstrates a structured approach to enhancing sustainable learning abilities in alignment with global trends and local needs.

Stage 3: The adaptability and feasibility of educational management strategies to improve students' sustainable learning ability in higher vocational colleges in Guangdong Province

Results of Evaluating the Adaptability and Feasibility of Educational Management Strategies to Improve Students' Sustainable Learning Ability in Higher Vocational Colleges in Guangdong Province. Overall, the educational management strategies were deemed highly adaptable and feasible. This outcome is attributed to their development through a rigorous research process that involved multiple stages. These stages included synthesizing relevant documents, academic articles, and research studies and employing questionnaires to assess the current state and desired improvements in students' sustainable learning ability. The draft strategies were formulated based on these findings and refined through focus group discussions (FGDs) with experts. Recommendations and feedback gathered from the discussions were integrated to enhance the strategies, thereby increasing their reliability and relevance. Finally, the strategies were thoroughly evaluated by experts with extensive knowledge and experience in strategy development and enhancing sustainable learning ability. This comprehensive approach ensured that the developed strategies were credible and practical for real-world implementation. Studies such as those by Zhang et al. (2021) and Liu et al. (2019) emphasize the importance of expert-driven evaluation processes in ensuring the adaptability and feasibility of educational strategies. Furthermore, research by Kim and Park (2020) highlights the significance of iterative feedback and refinement processes in creating effective educational frameworks. The high levels of adaptability and feasibility achieved in this study demonstrate the strategies' potential to address the needs and challenges of sustainable learning in higher vocational institutions, aligning with national education policies and global trends in lifelong learning and skills development.

The research on improving students' sustainable learning abilities in higher vocational colleges in Guangdong Province reveals key findings across three stages:

1. Current and Expected Situations: The study identifies three main factors impacting students' sustainable learning: school environment, teacher, and student factors. Key strengths include diverse learning resources and critical thinking abilities, while weaknesses lie in community-based learning, teacher collaboration, and

students' resilience and perseverance. Recommendations for improvement include enhancing community partnerships, promoting innovative teaching strategies, and fostering emotional resilience in students.

2. Educational Management Strategies: Five integrated strategies were developed to improve students' sustainable learning:

2.1 Learning Ecosystem Enhancement: Creating an inclusive, adaptive learning environment.

2.2 Teaching and Learning Empowerment: Empowering educators and students through innovative pedagogical approaches.

2.3 Policy and Collaboration-Driven Development: Aligning institutional policies with sustainable learning practices.

2.4 Technology and Resilience Integration: Leveraging technology to foster resilience and adaptability.

2.5 Community-Engaged and Innovative Collaboration: Emphasizing community engagement and collaborative learning to enhance practical outcomes.

3. Adaptability and Feasibility: The developed strategies were evaluated as highly adaptable and feasible. The strategies underwent extensive expert evaluation and refinement, ensuring their practical applicability in improving students' sustainable learning abilities in alignment with global trends and local needs. These strategies emphasize innovation, resilience, and collaboration, contributing to the sustainable development of students' learning abilities in higher vocational education.

Recommendations

1. Recommendations for Applying Research Findings

In the application research of the management strategy of sustainable learning ability education for students in vocational colleges, it is necessary to cooperate with multiple parties to promote the cultivation of sustainable learning ability jointly. The following suggestions are put forward for five aspects: higher vocational colleges, government education authorities, education researchers, students, and industry stakeholders:

1.1 Higher vocational colleges: building a sustainable learning ecosystem

Curriculum system optimization: Integrate sustainable learning ability training goals and strengthen learning methods, innovative thinking, digital literacy, and other related courses.

Teaching mode innovation: Blended learning, project-based learning (PBL), task-driven learning, etc., to improve students' self-directed learning and lifelong

learning ability.

Academic support system: Provide learning counseling, academic guidance, career development planning, and other support to help students develop good study habits.

Deepening school-enterprise cooperation: Students can cultivate continuous learning ability in real situations through modern apprenticeship and integration of industry and education.

1.2 Government education authorities: Policy guidance and Resource guarantee

Policy support: Issued guidance documents to encourage vocational colleges to cultivate students' sustainable learning ability and clarified the status of sustainable learning ability in the talent training system.

Funding and resource investment: Increase investment in digital learning resources, teacher training, and the construction of online learning platforms to improve the accessibility of educational resources.

Evaluation and supervision mechanism: Establish a monitoring and evaluation system for the development of sustainable learning ability and incorporate it into the quality evaluation system of talent training in higher vocational colleges.

1.3 Educational researchers: theoretical deepening and practical exploration

Theoretical framework construction: improve the conceptual system of sustainable learning ability of higher vocational students, learn from international advanced experience, and put forward localized education management strategies.

Empirical research promotion: Research the analysis of students' learning behavior and the evaluation of the effect of educational intervention so as to provide a scientific basis for higher vocational colleges.

Teaching method innovation: Research learning strategies suitable for higher vocational students, such as teaching mode based on ability training, personalized learning path, etc.

1.4 Students: Take the initiative to develop sustainable learning habits

Self-driven learning: Cultivate a sense of active learning and use various online and offline resources to improve their capabilities continuously.

Lifelong learning planning: Formulate personal learning plans based on career development needs to improve professional quality and comprehensive ability continuously.

Technology-enabled learning: Leverage digital learning tools, such as MOOCs, online courses, and AI tutoring, to improve learning efficiency.

1.5 Industry stakeholders: Build a learning career ecosystem

Corporate training and continuing education: Enterprises should provide opportunities for continuous learning, such as on-the-job training and vocational skills improvement programs, to promote the combination of learning and application.

Guidance of industry standards: Industry associations should promote the inclusion of sustainable learning ability in professional standards and guide the direction of talent training.

School-enterprise joint training mechanism: Enterprises and colleges jointly build courses and provide training bases so that students can exercise their continuous learning ability in a real environment.

Cultivating students' sustainable learning ability in vocational colleges needs to be promoted by the colleges, the government, researchers, students, and industry. Institutions need to optimize curriculum and teaching, the government provides policies and resource guarantees, researchers deepen theory and practice, students develop active learning habits, and the industry provides support and guidance so as to build a sustainable learning ecosystem jointly.

2. Recommendations for Future Research

In future research on the management strategy of students' sustainable learning ability education in vocational colleges, it is necessary to deepen the theory further and practice through multi-party collaboration. The following future research suggestions are put forward from five aspects: higher vocational colleges, government education authorities, education researchers, students, and industry stakeholders:

2.1 Higher vocational colleges: explore diversified training models

Construction of intelligent learning environment: Research on personalized learning platforms based on big data, artificial intelligence (AI), virtual reality (VR), and other technologies to improve students' independent learning ability.

Interdisciplinary Convergence Research: Explore the integration of sustainable learning ability cultivation into multidisciplinary fields, such as information technology, professional ethics, innovation and entrepreneurship education, etc.

Optimization of teaching quality evaluation mechanism: Research on how to incorporate sustainable learning ability indicators into the teaching evaluation system to improve the scientificity of curriculum and teaching design.

International Comparative Study: Learn from the successful experiences of different countries and regions to explore sustainable learning and training paths suitable for China's higher vocational colleges.

2.2 Government education authorities: Promote innovation in policy and evaluation systems

Policy Effectiveness Research: Analyze the impact of current policies on cultivating students' sustainable learning ability in vocational colleges and provide data support for future policy optimization.

Research on the construction of a lifelong learning system: Explore the construction of a learning system that connects academic education and non-academic education and promote the connection between higher vocational education and continuing education.

Research on regional development differences: Given the uneven allocation of higher vocational education resources in different regions, this paper studies how to optimize regional policies and promote equity and quality improvement.

Research on multiple evaluation systems: Explore how to construct an evaluation system for students' learning ability that meets the needs of the industry, including process evaluation, post-graduation follow-up survey, etc.

2.3 Educational researchers: Deepen theoretical construction and empirical analysis

Research and development of sustainable learning ability assessment tools: Design scientific assessment tools to accurately assess the development level of sustainable learning ability of higher vocational students.

Research on learning behavior and psychological mechanism: Big data, neuroscience, and other methods are used to analyze the learning behavior, cognitive characteristics, and influencing factors of higher vocational students.

Research on Educational Technology Empowerment: Discuss how to use AI, blockchain, and other technologies to support the personalized learning of higher vocational students and improve their learning motivation.

Action Research and Practice Validation: Conduct long-term follow-up studies to verify the impact of different educational management strategies on students' sustainable learning ability.

2.4 Students: Research on the cultivation of self-learning ability and social support mechanism

Research on Learner Autonomy: This paper explores how higher vocational students can enhance their awareness of self-directed learning, improve their learning motivation, and realize the transformation from passive learning to active learning.

Research on the Correlation between Study Habits and Career Development: Analyze how students' learning habits affect their career development in order to

optimize the talent training model.

Research on Psychological and Cultural Factors: To study the influence of different cultural backgrounds, genders, and family environments on the cultivation of sustainable learning ability of higher vocational students.

Research on Learning Communities and Community Support: To explore how to use community learning and peer support to build a suitable environment for vocational students to continue learning.

2.5 Industry Stakeholders: Research on the Integration of Industry and Education and Career Development

Research on Enterprise-led Lifelong Learning Model: Analyze how enterprises promote continuous learning of higher vocational graduates in the workplace, such as on-the-job training and career promotion paths.

Research on matching industry needs and talent training: Study the specific requirements of the industry for continuous learning ability and optimize the curriculum and teaching content of higher vocational colleges.

Research on the Workplace Learning (WPL) model: to explore how to help students continuously improve their skills in the work environment through modern apprenticeships and corporate mentorships.

Research on Vocational Qualification Certification and Continuing Education: Analyze how higher vocational students can enhance their competitiveness through industry certification and skill improvement training.

Future research on the sustainable learning ability of students in vocational colleges should focus on key topics such as intelligent education, lifelong learning systems, students' self-directed learning behavior, and industry-education integration models. Higher vocational colleges can strengthen multidisciplinary research, the government should optimize policy support, researchers need to deepen theoretical and empirical analysis, students need to improve their learning initiative, and the industry needs to promote the construction of a lifelong learning system.

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Appendixes

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	Qiu Yuan	Professor of HeYuan Polytechnic
5	Liao Yuanbing	Professor of HeYuan Polytechnic

List of Interview Experts Invitation

NO	Workplace	Name	Education and work background
1	Shenzhen Vocational and Technical College	Sun Bin	Position: Deputy Director of Research Department Title: Associate Professor Education: Master Work Experience: 19 Years
2	Shenzhen Vocational and Technical College	Xu Hang	Position: Director of Development Planning Department Title: Professor Education: Doctor Work Experience: 23 Years
3	Maoming Vocational and Technical College	Zhao Shuang	Position: Vice Dean of School of Mechanical and Electrical Engineering Title: Professor Education: Master Work Experience: 16 Years
4	Maoming Vocational and Technical College	Yang Haibing	Position: Deputy Director of Development Planning Department Title: Professor Education: Doctor Work Experience: 18 Years
5	Heyuan Vocational and Technical College	Chen Yanfang	Position: Deputy Director of Academic Affairs Office Title: Professor Education: Bachelor Work Experience: 20 Years
6	Heyuan Vocational and Technical College	Liao Yuanlai	Position: Deputy Director of Academic Affairs Office Title: Associate Professor Education: Master Work Experience: 23 Years
7	Shanwei Vocational and Technical College	Ye Feifei	Position: Director of the Practice Section of the Academic Affairs Office Title: Associate Professor

NO	Workplace	Name	Education and work background
			Education: Master Years of work experience: 15
8	Shanwei Vocational and Technical College	Chen Heping	Position: Director of the Teaching Section of the Academic Affairs Office Title: Associate Professor Education: Master Years of work experience: 15

List of Focus Group Interviewees

NO	Workplace	Name	Education and work background
1	Shenzhen Vocational and Technical College	Sun Bin	Position: Deputy Director of Research Department Title: Associate Professor Education: Master Work Experience: 19 Years
2	Shenzhen Vocational and Technical College	Xu Hang	Position: Director of Development Planning Department Title: Professor Education: Doctor Work Experience: 23 Years
3	Shenzhen Vocational and Technical College	Chen Yuanyuan	Position: Director of the School-Enterprise Office of the School of Electronic Information Title: Associate Professor Education: Master Work Experience: 15 years
4	Maoming Vocational and Technical College	Zhao Shuang	Position: Vice Dean of School of Mechanical and Electrical Engineering Title: Professor Education: Master Work Experience: 16 Years
5	Maoming Vocational and Technical College	Yang Haibing	Position: Deputy Director of Development Planning Department Title: Professor Education: Doctor Work Experience: 18 Years
6	Maoming Vocational and Technical College	Xiao Liping	Position: Director of the School-Enterprise Office of the School of Mechanical and Electrical Engineering Title: Associate Professor Education: Master Work Experience: 16 years

NO	Workplace	Name	Education and work background
7	Heyuan Vocational and Technical College	Chen Yanfang	Position: Deputy Director of Academic Affairs Office Title: Professor Education: Bachelor Work Experience: 20 Years
8	Heyuan Vocational and Technical College	Liao Yuanlai	Position: Deputy Director of Academic Affairs Office Title: Associate Professor Education: Master Work Experience: 23 Years
9	Heyuan Vocational and Technical College	Zhou Yongfu	Position: Vice Dean of School of Telecommunications Title: Associate Professor Education: Bachelor's degree Work experience: 22 years
10	Shanwei Vocational and Technical College	Ye Feifei	Position: Director of the Practice Section of the Academic Affairs Office Title: Associate Professor Education: Master Years of work experience: 15
11	Shanwei Vocational and Technical College	Chen Heping	Position: Director of the Teaching Section of the Academic Affairs Office Title: Associate Professor Education: Master Years of work experience: 15
12	Shanwei Vocational and Technical College	Fu Qing	Position: Head of the School-Enterprise Cooperation Section of the Research Department Title: Associate Professor Education: Master Work Experience: 16 years

List of Specialists Invitation for Strategies Evaluation

The following list was invited as evaluation experts to evaluate the adaptability and feasibility of the educational management strategies for improving students' sustainable learning ability in higher vocational colleges in Guangdong Province.

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	Assistant 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/

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

20 January 2025

Subject Invitation to validate research instrument

Dear Assistant Professor Dr. Luxana Keyuraphan

Regarding Mr. Dai Baiyang with student code 6473139006, a doctoral student majoring in Sustainable Development Education Management at Bansomdejchaopraya Rajabhat University. The thesis is entitled "Educational management strategies to improve the students' sustainable learning ability in higher vocational colleges in Guangdong Province" 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
10600

20 January 2025

Subject Invitation to validate research instrument

Dear Assistant Professor Dr. Sahapat Insee

Regarding Mr. Dai Baiyang with student code 6473139006, a doctoral student majoring in Sustainable Development Education Management at Bansomdejchaopraya Rajabhat University. The thesis is entitled "Educational management strategies to improve the students' sustainable learning ability in higher vocational colleges in Guangdong Province" 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

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20 January 2025

Subject Invitation to validate research instrument

Dear Assistant Professor Dr. Sunate Thaveethavornsawat

Regarding Mr. Dai Baiyang with student code 6473139006, a doctoral student majoring in Sustainable Development Education Management at Bansomdejchaopraya Rajabhat University. The thesis is entitled "Educational management strategies to improve the students' sustainable learning ability in higher vocational colleges in Guangdong Province" 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

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20 January 2025

Subject Invitation to validate research instrument

Dear Liao Yuanbing Professor

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Dear Qiu Yuan Professor

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20 January 2025

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Dear Sun Bin Associate Professor

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Rajabhat University
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Itsaraphap Road, Hiranruchi,
Thonburi, Bangkok, Thailand
10600

20 January 2025

Subject Invitation to participate in the strategic evaluate as an expert

Dear Assistant Professor Dr. Phisanu Bangkheow

Mr. Dai Baiyang is a graduate student in Doctor of Philosophy Program in Educational Management for Sustainable Development program of Bansomdejchaopraya Rajabhat University. He is undertaking research entitled "Educational management strategies to improve the students' sustainable learning ability in higher vocational colleges in Guangdong Province", 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 join the focus group discussion to provide the student with suggestions for his research.

Thank you for your kind considerations.

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Dear Associate Professor Dr. Jittawisut Wimttipanya

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20 January 2025

Subject Invitation to participate in the strategic evaluate as an expert

Dear Assistant Professor Dr. Sarayut Setthakhoncharoen

Mr. Dai Baiyang is a graduate student in Doctor of Philosophy Program in Educational Management for Sustainable Development program of Bansomdejchaopraya Rajabhat University. He is undertaking research entitled "Educational management strategies to improve the students' sustainable learning ability in higher vocational colleges in Guangdong Province", supervised by the thesis advisory committee 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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Appendix C
Research Instrument

Questionnaire on the Current Status of Sustainable Learning Ability of Students in Higher Vocational Colleges in Guangdong Province (Students)

Description:

In order to understand the current status of students' sustainable learning abilities in higher vocational colleges in Guangdong Province, and to propose educational management strategies that are conducive to the sustainable learning ability of students in higher vocational colleges in Guangdong Province, a questionnaire survey will be conducted on among students in higher vocational colleges in Guangdong Province

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: Respondent Identity (Personal Information)

1. School:
   - ☐ Shenzhen Vocational and Technical University
   - ☐ Shanwei Vocational and Technical College
   - ☐ Maoming Vocational and Technical College
   - ☐ Heyuan Vocational and Technical College
2. Gender:
   - ☐ Male
   - ☐ Female
3. Grade:
   - ☐ First year of university
   - ☐ Second year of university
   - ☐ Third year of university

Part 2 Questionnaire

Please read the following items carefully and answer truthfully according to your actual situation and experience. Likert 5-point rating scale (1 means strongly disagree, 2 means basically disagree, 3 means not sure, 4 means basically agree, and 5 means strongly agree.)

NO	Assessment ltems	Current situations					Expected situations				
		1	2	3	4	5	1	2	3	4	5
Management Factors											
1	The school should give students the initiative in learning and encourage them to ask questions, participate in discussions, and explore independently.										
2	The school should design open-ended courses to guide students to acquire knowledge through independent inquiry and develop the ability to analyze and solve problems.										
3	The school should connect learning content with real life and allow students to design and implement projects independently, reflect on their experiences, and evaluate their progress to deepen and broaden their learning.										
4	Schools should provide a variety of learning resources and tools, such as library resources, equipment, networks, online learning platforms, field trips, etc., to meet the different learning needs and preferences of students.										
5	The school should provide a good learning space where students can focus on their studies without interruption.										
6	The school should integrate the concept of learning into its culture and establish relevant regulations and measures.										
7	The school should encourage students to participate in school management and provide a platform for them to express their opinions.										
8	The school should work with parents to explore ways to cultivate students' learning ability and reach a consensus on educational philosophy and										

NO	Assessment ltems	Current situations					Expected situations				
		1	2	3	4	5	1	2	3	4	5
	methods.										
9	The school should guide parents to change their traditional "filling-in-the-blanks" style of education and instead encourage their children to learn independently and respect their children's learning interests and characteristics.										
10	The school should integrate community learning resources to effectively enhance the quality of students' education.										
	Teacher Factors										
1	Teachers should pay attention to the thinking, exploration, cooperation, etc., in the learning process of students, not just the end result.										
2	Teachers should use a variety of evaluation methods, such as classroom performance, homework completion, project results, self-reflection, etc., to comprehensively evaluate students' learning.										
3	Teachers should give timely feedback to students to help them understand their learning situation and make improvements based on the feedback.										
4	A teacher? We should encourage students to learn, communicate and cooperate with each other, establish a good relationship between teachers and students, and make students feel safe, trusted and respected.										
5	Teachers should provide students with the opportunity to try and make mistakes, and cultivate students' creativity and exploration spirit.										
6	What do teachers want? Organize students to participate in field trips, combine theoretical knowledge with practice, and enhance students'										

NO	Assessment Items	Current situations					Expected situations				
		1	2	3	4	5	1	2	3	4	5
	learning interest and understanding ability.										
7	Teachers should strengthen the study and research of independent learning theory, constantly improve teaching ability and teaching methods, and guide students to carry out independent learning.										
8	Teachers should adopt a variety of teaching modes, such as flipped classroom, blended teaching, etc., in order to better stimulate students' learning interest and independent learning ability.										
9	Teachers should strengthen team cooperation, learn from each other, communicate and cooperate, and jointly explore and practice effective strategies for independent learning										
10	Teachers should actively learn and master new knowledge and technology, keep pace with the development of The Times, and provide students with better learning resources and guidance										
Student Factors											
1	Students should arrange their time reasonably, improve their learning efficiency, avoid procrastination and establish good learning habits.										
2	Students should have effective learning strategies, such as reading skills, note-taking methods, review methods, etc., to improve learning efficiency and effectiveness.										
3	Students should have the ability of information retrieval, learn to use a variety of channels to obtain information, and to screen and judge information.										
4	Students should think independently, dare to question, and critically analyze to form their own opinions and judgments.										
5	Students should learn self-motivation and self-										

NO	Assessment ltems	Current situations					Expected situations				
		1	2	3	4	5	1	2	3	4	5
	management, maintain a positive learning attitude and good learning habits.										
6	Students should regularly reflect on their learning process, sum up their learning experience, find out their shortcomings in learning, and adjust their learning strategies according to the evaluation results to continuously improve their learning ability.										
7	Students should be willing to try and make mistakes, learn from mistakes, and constantly improve their learning methods.										
8	Students should set clear learning goals and formulate specific learning plans according to the goals to make learning more directional and purposeful.										
9	Students should overcome the difficulties and setbacks in the learning process, persevere in learning, actively seek help, and constantly improve their learning ability.										
10	Students should maintain a positive and optimistic attitude, enjoy the process of learning, believe that they can learn well, and get fun and sense of achievement from learning, so as to love learning more.										

Interview Form for the Education Management Strategy of Sustainable Learning Ability of Students in Higher Vocational Colleges in Guangdong Province (Education Management Personnel)

Description:

This study selected 8 respondents from four colleges and universities. Teaching management personnel must meet the following conditions: 1) Work in the school for more than 5 years; 2) Be familiar with the specific situation of school development planning, teaching management and student development; 3) Must be willing to participate in structured interview recording; 4) Must be willing to review the interview record for verification.

Part I: Interviewee Identity (Personal Information)

1. Name (Interviewee):_____.
2. Position:_____.
3. Work Unit:_____.
4. Interview Date:_____.
5. Interview Duration:_____.

Part II Interview Outline

Content	Questions
Management factor	1. In view of the current situation of students' sustainable independent learning ability in higher vocational colleges in Guangdong Province, what strategies should schools adopt to improve students' sustainable independent learning ability?
Teacher factor	2. In view of the current situation of students' sustainable independent learning ability in higher vocational colleges in Guangdong Province, what strategies should teachers adopt to improve students' sustainable independent learning ability?
Student factor	3. In view of the current situation of students' sustainable independent learning ability in higher vocational colleges in Guangdong Province, what strategies should students adopt to improve their sustainable independent learning ability?

Validity Evaluation Form of Questionnaire on the Current Situation of Students' Sustainable Learning Ability in Higher Vocational Colleges in Guangdong Province

Research Title: Educational management strategies for improving students' sustainable learning ability in higher vocational colleges in Guangdong Province

Research Purpose:

1.To study the current situation of students' sustainable learning ability in higher vocational colleges in Guangdong Province.

2.To develop educational management strategies to improve the students' sustainable learning ability in higher vocational colleges in Guangdong Province.

3.To evaluate the suitability and feasibility of educational management strategies to improve the students' sustainable learning ability in higher vocational colleges in Guangdong Province.

Assessor's Name:_____.

Job Title/Position:_____.

Work Unit:_____.

Years of Work Experience:_____.

When using the questionnaire, please evaluate whether the contents in the questionnaire about the actual perception of Guangdong higher vocational students on the current situation of Guangdong higher vocational students' sustainable learning ability are consistent. After the evaluation, please tick the corresponding box. Please evaluate according to the following criteria: -1 = does not match the definition, 0 = not sure whether it meets the definition, +1 = corresponds to the definition.

NO	Assessment ltems	Evaluation result		
		-1	0	1
Management Factors				
1	The school should give students the initiative in learning and encourage them to ask questions, participate in discussions, and explore independently.			
2	The school should design open-ended courses to guide students to acquire knowledge through independent inquiry			

NO	Assessment Items	Evaluation result		
		-1	0	1
	and develop the ability to analyze and solve problems.			
3	The school should connect learning content with real life and allow students to design and implement projects independently, reflect on their experiences, and evaluate their progress to deepen and broaden their learning.			
4	Schools should provide a variety of learning resources and tools, such as library resources, equipment, networks, online learning platforms, field trips, etc., to meet the different learning needs and preferences of students.			
5	The school should provide a good learning space where students can focus on their studies without interruption.			
6	The school should integrate the concept of learning into its culture and establish relevant regulations and measures.			
7	The school should encourage students to participate in school management and provide a platform for them to express their opinions.			
8	The school should work with parents to explore ways to cultivate students' learning ability and reach a consensus on educational philosophy and methods.			
9	The school should guide parents to change their traditional "filling-in-the-blanks" style of education and instead encourage their children to learn independently and respect their children's learning interests and characteristics.			
10	The school should integrate community learning resources to effectively enhance the quality of students' education.			
Teacher Factors				
1	Teachers should pay attention to the thinking, exploration, cooperation, etc., in the learning process of students, not just the end result.			
2	Teachers should use a variety of evaluation methods, such as classroom performance, homework completion, project results, self-reflection, etc., to comprehensively evaluate students' learning.			

NO	Assessment Items	Evaluation result		
		-1	0	1
3	Teachers should give timely feedback to students to help them understand their learning situation and make improvements based on the feedback.			
4	A teacher? We should encourage students to learn, communicate and cooperate with each other, establish a good relationship between teachers and students, and make students feel safe, trusted and respected.			
5	Teachers should provide students with the opportunity to try and make mistakes, and cultivate students' creativity and exploration spirit.			
6	What do teachers want? Organize students to participate in field trips, combine theoretical knowledge with practice, and enhance students' learning interest and understanding ability.			
7	Teachers should strengthen the study and research of independent learning theory, constantly improve teaching ability and teaching methods, and guide students to carry out independent learning.			
8	Teachers should adopt a variety of teaching modes, such as flipped classroom, blended teaching, etc., in order to better stimulate students' learning interest and independent learning ability.			
9	Teachers should strengthen team cooperation, learn from each other, communicate and cooperate, and jointly explore and practice effective strategies for independent learning			
10	Teachers should actively learn and master new knowledge and technology, keep pace with the development of The Times, and provide students with better learning resources and guidance			
Student Factors				
1	Students should arrange their time reasonably, improve their learning efficiency, avoid procrastination and establish good learning habits.			
2	Students should have effective learning strategies, such as			

NO	Assessment Items	Evaluation result		
		-1	0	1
	reading skills, note-taking methods, review methods, etc., to improve learning efficiency and effectiveness.			
3	Students should have the ability of information retrieval, learn to use a variety of channels to obtain information, and to screen and judge information.			
4	Students should think independently, dare to question, and critically analyze to form their own opinions and judgments.			
5	Students should learn self-motivation and self-management, maintain a positive learning attitude and good learning habits.			
6	Students should regularly reflect on their learning process, sum up their learning experience, find out their shortcomings in learning, and adjust their learning strategies according to the evaluation results to continuously improve their learning ability.			
7	Students should be willing to try and make mistakes, learn from mistakes, and constantly improve their learning methods.			
8	Students should set clear learning goals and formulate specific learning plans according to the goals to make learning more directional and purposeful.			
9	Students should overcome the difficulties and setbacks in the learning process, persevere in learning, actively seek help, and constantly improve their learning ability.			
10	Students should maintain a positive and optimistic attitude, enjoy the process of learning, believe that they can learn well, and get fun and sense of achievement from learning, so as to love learning more.			

Signature:_____.

Date: _____.

Interview Outline Effectiveness Evaluation Form for Educational Management Strategies for Improving Students' Sustainable Learning Ability in Higher Vocational Colleges in Guangdong Province

Research Title: Educational management strategies for improving students' sustainable learning ability in higher vocational colleges in Guangdong Province

Research Purpose:

1.To study the current situation of students' sustainable learning ability in higher vocational colleges in Guangdong Province.

2.To develop educational management strategies to improve the students' sustainable learning ability in higher vocational colleges in Guangdong Province.

3.To evaluate the suitability and feasibility of educational management strategies to improve the students' sustainable learning ability in higher vocational colleges in Guangdong Province.

When using the interview, please evaluate whether the interview is correct about the sustainable development strategy of industry-education integration in higher vocational colleges in Guangdong Province. After evaluation, please tick the corresponding box. Please evaluate according to the following criteria: -1 = does not match the definition, 0 = not sure whether it meets the definition, +1 = corresponds to the definition.

Content	Questions	Evaluation result		
		-1	0	1
Management factor	1. In view of the current situation of students' sustainable independent learning ability in higher vocational colleges in Guangdong Province, what strategies should schools adopt to improve students' sustainable independent learning ability?			
Teacher factor	2. In view of the current situation of students' sustainable independent learning ability in higher vocational colleges in Guangdong Province, what strategies should teachers adopt to improve students' sustainable independent learning			

Content	Questions	Evaluation result		
		-1	0	1
	ability?			
Student factor	3. In view of the current situation of students' sustainable independent learning ability in higher vocational colleges in Guangdong Province, what strategies should students adopt to improve their sustainable independent learning ability?			

Suggestion:_____.

Signature:_____.

Date:_____.

Evaluation Form for Educational management strategies for improving students' sustainable learning ability in higher vocational colleges in Guangdong Province

Direction:

1. This questionnaire validity evaluation form was prepared by experts to consider the consistency of the questionnaire and make suggestions. It is part of the doctoral dissertation of Educational Management at Bansongdechaopraya Rajabhat University, Thailand. This study aims to explore the components of improving students' sustainable learning ability in higher vocational colleges in Guangdong Province, formulate educational management strategies to promote the improvement of students' sustainable learning ability in higher vocational colleges in Guangdong Province, and evaluate the educational management strategies for improving students' sustainable learning ability in higher vocational colleges in Guangdong Province.

2. This questionnaire validity evaluation form focuses on 3 aspects and covers all strategies.

3. Your comments on the interview validity evaluation form will help to formulate educational management strategies for improving students' sustainable learning ability in higher vocational colleges in Guangdong Province. Answering this questionnaire will not have any impact on you personally. The data provided will be an overview, and the researcher intends to use the data for research purposes only.

Thank you for your cooperation in answering this validity evaluation form.

Mr.Dai Baiyang
Bansomdejchaopraya Rajabhat University

Instruction:

The tool used this time is a questionnaire to evaluate educational management strategies for improving students' sustainable learning ability in higher vocational colleges in Guangdong Province.

Please consider the questionnaire to evaluate all aspects of educational management strategies for improving students' sustainable learning ability in higher vocational colleges in Guangdong Province.

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
Learning Ecosystem Enhancement Strategy										
1. Establishing Inclusive Learning Spaces										
2. Diversified educational resources										
3. Policy-driven vocational										
4. Teacher Innovation Training Program										
5. Strengthen international exchanges and cooperation										
Teaching and Learning Empowerment Strategy										
1. Capacity-Building for Educators										
2. Mentorship and Peer Support Programs										
3. Dynamic Curriculum Design										
4. Student Empowerment Workshops										
5. Implementing Technology-Assisted Learning Tools										
Policy and Collaboration-Driven Development Strategy										
1. Set clear educational goals										
2. Optimize the curriculum system										
3. Support personalized learning										
4. Strengthen the partnership between schools and the government, families, enterprises and communities										
5. Evaluation and feedback										
Technology and Resilience Integration Strategy										
1. Utilize online education platforms and digital resources										

Evaluation checklist	Adaptability					Feasibility				
	5	4	3	2	1	5	4	3	2	1
2. Adopt project-based learning and virtual experiments										
3. Apply intelligent learning systems										
4. Integrate resilience training into educational practice										
5. Encourage attempts and challenges										
Community-engaged and Innovative Collaboration Strategy										
1. Community Learning Resource Partner Program										
2. Strengthen home-school cooperation										
3. Introduce case teaching										
4. Carry out social practice										
5. Strengthen internships and training										

Suggestions .....
.....
.....

Sign.....Assessor
(.....)
Date...../...../.....

Appendix D
The Results of the Quality Analysis of Research Instruments

The Quality Analysis Results of Research Instruments

Consistency evaluation results of the questionnaire survey on sustainable learning ability strategies of students in higher vocational colleges in Guangdong Province

1. Quality analysis results of the sustainable learning ability strategy questionnaire.

clause	The Current Situation of Students' Sustainable Learning Ability in Higher Vocational Colleges in Guangdong Province	Experts					IOC	Conclusion
		1	2	3	4	5		
Management Factors								
1	The school should give students the initiative in learning and encourage them to ask questions, participate in discussions, and explore independently.	1	1	1	1	1	1.00	consistent
2	The school should design open-ended courses to guide students to acquire knowledge through independent inquiry and develop the ability to analyze and solve problems.	1	1	-1	1	1	0.80	consistent
3	The school should connect learning content with real life and allow students to design and implement projects independently, reflect on their experiences, and evaluate their progress to deepen and broaden their learning.	1	1	1	1	1	1.00	consistent
4	Schools should provide a variety of learning resources and tools, such as library resources, equipment, networks, online learning platforms, field trips, etc., to meet the different learning needs and preferences of students.	1	1	1	0	1	0.80	consistent
5	The school should provide a good learning space where students can focus on their studies without interruption.	1	1	1	1	1	1.00	consistent
6	The school should integrate the concept of learning into its culture and establish relevant regulations and measures.	1	1	1	1	1	1.00	consistent
7	The school should encourage students to	1	1	1	1	1	1.00	consistent

clause	The Current Situation of Students' Sustainable Learning Ability in Higher Vocational Colleges in Guangdong Province	Experts					IOC	Conclusion
		1	2	3	4	5		
	participate in school management and provide a platform for them to express their opinions.							
8	The school should work with parents to explore ways to cultivate students' learning ability and reach a consensus on educational philosophy and methods.	1	1	1	1	1	1.00	consistent
9	The school should guide parents to change their traditional "filling-in-the-blanks" style of education and instead encourage their children to learn independently and respect their children's learning interests and characteristics.	1	1	1	1	1	1.00	consistent
10	The school should integrate community learning resources to effectively enhance the quality of students' education.	1	1	1	1	1	1.00	consistent
Teachers Factors								
11	Teachers should pay attention to the thinking, exploration, cooperation, etc., in the learning process of students, not just the end result.	1	1	1	1	1	1.00	consistent
12	Teachers should use a variety of evaluation methods, such as classroom performance, homework completion, project results, self-reflection, etc., to comprehensively evaluate students' learning.	1	1	1	1	1	1.00	consistent
13	Teachers should give timely feedback to students to help them understand their learning situation and make improvements based on the feedback.	1	1	1	1	1	1.00	consistent
14	A teacher? We should encourage students to learn, communicate and cooperate with each other, establish a good relationship between teachers and students, and make students	1	1	1	1	1	1.00	consistent

clause	The Current Situation of Students' Sustainable Learning Ability in Higher Vocational Colleges in Guangdong Province	Experts					IOC	Conclusion
		1	2	3	4	5		
	feel safe, trusted and respected.							
15	Teachers should provide students with the opportunity to try and make mistakes, and cultivate students' creativity and exploration spirit.	1	1	1	1	1	1.00	consistent
16	What do teachers want? Organize students to participate in field trips, combine theoretical knowledge with practice, and enhance students' learning interest and understanding ability.	1	1	1	1	1	1.00	consistent
17	Teachers should strengthen the study and research of independent learning theory, constantly improve teaching ability and teaching methods, and guide students to carry out independent learning.	1	1	1	1	1	1.00	consistent
18	Teachers should adopt a variety of teaching modes, such as flipped classroom, blended teaching, etc., in order to better stimulate students' learning interest and independent learning ability.	1	1	1	1	1	1.00	consistent
19	Teachers should strengthen team cooperation, learn from each other, communicate and cooperate, and jointly explore and practice effective strategies for independent learning	1	1	1	1	1	1.00	consistent
20	Teachers should actively learn and master new knowledge and technology, keep pace with the development of The Times, and provide students with better learning resources and guidance	1	1	1	1	1	1.00	consistent
Student Factors								
21	Students should arrange their time reasonably, improve their learning efficiency, avoid procrastination and establish good learning	1	1	-1	1	1	0.60	consistent

clause	The Current Situation of Students' Sustainable Learning Ability in Higher Vocational Colleges in Guangdong Province	Experts					IOC	Conclusion
		1	2	3	4	5		
	habits.							
22	Students should have effective learning strategies, such as reading skills, note-taking methods, review methods, etc., to improve learning efficiency and effectiveness.	1	1	1	1	1	1.00	consistent
23	Students should have the ability of information retrieval, learn to use a variety of channels to obtain information, and to screen and judge information.	1	1	1	1	1	1.00	consistent
24	Students should think independently, dare to question, and critically analyze to form their own opinions and judgments.	1	1	1	1	1	1.00	consistent
25	Students should learn self-motivation and self-management, maintain a positive learning attitude and good learning habits.	1	1	1	1	1	1.00	consistent
26	Students should regularly reflect on their learning process, sum up their learning experience, find out their shortcomings in learning, and adjust their learning strategies according to the evaluation results to continuously improve their learning ability.	1	1	1	1	1	1.00	consistent
27	Students should be willing to try and make mistakes, learn from mistakes, and constantly improve their learning methods.	1	1	1	1	1	1.00	consistent
28	Students should set clear learning goals and formulate specific learning plans according to the goals to make learning more directional and purposeful.	1	1	1	1	1	1.00	consistent
29	Students should overcome the difficulties and setbacks in the learning process, persevere in learning, actively seek help, and constantly improve their learning ability.	1	0	1	0	1	0.60	consistent
30	Students should maintain a positive and	1	1	1	1	1	1.00	consistent

clause	The Current Situation of Students' Sustainable Learning Ability in Higher Vocational Colleges in Guangdong Province	Experts					IOC	Conclusion
		1	2	3	4	5		
	optimistic attitude, enjoy the process of learning, believe that they can learn well, and get fun and sense of achievement from learning, so as to love learning more.							

2.The quality analysis results of Interview.

clause	Questions	Experts					IOC	Conclusion
		1	2	3	4	5		
1	1. In view of the current situation of students' sustainable independent learning ability in higher vocational colleges in Guangdong Province, what strategies should schools adopt to improve students' sustainable independent learning ability?	1	1	1	1	1	1.00	consistent
2	2. In view of the current situation of students' sustainable independent learning ability in higher vocational colleges in Guangdong Province, what strategies should teachers adopt to improve students' sustainable independent learning ability?	1	1	1	1	1	1.00	consistent
3	3. In view of the current situation of students' sustainable independent learning ability in higher vocational colleges in Guangdong Province, what strategies should students adopt to improve their sustainable independent learning ability?	1	1	1	1	1	1.00	consistent

Reliability analysis of research instruments

Reliability

Case handling summary			
		N	%
case	effective	384	100
	Excluded[a]	0	0
	Total	384	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
0.88	0.88	384

Appendix E
Certificate of English

Appendix F
The Document for Accept Research

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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 **Educational Management Strategies for Improving Students' Sustainable Learning Ability in Higher Vocational Colleges in Guangdong Province**, authored by **Dai Baiyang, 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 1 of *IJELS* on 31/01/2025.

Yours sincerely,

Vahid Nimehchisalem, PhD
Editor-in-Chief
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Educational Management Strategies Development for Improving Students' Sustainable Learning Ability in Higher Vocational Colleges in Guangdong Province

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ABSTRACT

This study explored strategies to enhance sustainable learning ability among students in higher vocational colleges in Guangdong Province. The research objectives were threefold: (1) to examine the current and expected situations of students' sustainable learning ability, (2) to develop educational management strategies to improve the students' sustainable learning ability, and (3) to explore the adaptability and feasibility of the educational management strategies to improve the students' sustainable learning ability. Utilizing a mixed-methods approach, data were collected from 384 students selected via multi-stage random sampling and analyzed using statistical tools, including the Modified Priority Needs Index ($PNI_{Modified}$), as well as qualitative methods like content analysis and expert evaluations. Findings highlighted three key components influencing sustainable learning: school environment, teacher, and student factors. The following results were obtained: (1) the current situation was rated as high (M=3.69), with the school environment scoring highest (M=3.77). Conversely, the expected situation was rated very high (M=4.52), revealing significant gaps in student factors ($PNI_{Modified}$=0.24) and teacher factors ($PNI_{Modified}$=0.23), identified as critical areas for development, (2) the development of educational management strategies was formulated across 8 aspects, encompassing 49 supporting projects, and (3) expert evaluations indicated the strategies had extremely high feasibility (M=4.71) and adaptability (M=4.59), underscoring their practical applicability.

Key words: Educational Management Strategies, Students' Sustainable Learning Ability, Higher Vocational Colleges

INTRODUCTION

In the 21st century, the ability to engage in sustainable learning is pivotal for individual growth, organizational innovation, and societal progress. Particularly in China, where human capital is a cornerstone of sustainable development, equipping students with the skills to learn continuously and adapt to an ever-changing environment is essential (Xiang, 2010). Higher vocational education, as a vital contributor to workforce development, faces an urgent need to cultivate students› sustainable learning ability skills that enable lifelong adaptability, problem-solving, and self-directed learning to meet evolving societal and technological demands (Chen, 2023; Shi, 2018).

Sustainable learning emphasizes self-directed, inquiry-based learning supported by cognitive strategies essential for lifelong education (Shan, 2011). The United Nations Educational, Scientific and Cultural Organization (UNESCO) underscores the role of sustainable learning in fostering self-efficacy, achieving educational goals, and driving social advancement. However, challenges persist in higher vocational education in China, where many students lack intrinsic motivation, active learning opportunities, and essential cognitive skills. This highlights the pressing need for well-designed educational management strategies to bridge these gaps. The rapid pace of technological and social changes demands that vocational students acquire sustainable learning ability to remain competitive. These abilities are critical not only for enhancing vocational competencies but also for supporting broader personal development. Nevertheless, current educational practices in vocational colleges often fall short. Structural gaps in the school environment, outdated teaching methodologies, and student attitudes further exacerbate the issue:

- *School Environment:* Many vocational institutions operate in resource-constrained settings, with insufficient

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infrastructure and limited technological tools to support independent and inquiry-based learning. Teacher-centered approaches dominate, reducing opportunities for active engagement and critical thinking (Shi, 2018).

- *Teachers:* Traditional teaching methods, often prevalent in vocational education, fail to encourage creativity, problem-solving, and long-term adaptability. Furthermore, insufficient training in modern pedagogical strategies prevents teachers from adequately supporting lifelong learning (Chen, 2023).
- *Students:* Many students regard vocational education merely as a means to secure employment, neglecting its potential to serve as a foundation for lifelong learning. This mindset limits their motivation to engage in continuous learning and develop critical thinking and self-directed learning skills (Shan, 2011).

In light of these challenges, the development of effective educational management strategies to enhance students' sustainable learning ability in higher vocational colleges is an urgent priority. In the context of Guangdong Province, where vocational education plays a pivotal role in supporting economic growth, such strategies must address systemic weaknesses and promote an environment conducive to lifelong learning. By doing so, vocational education can better align with the demands of modern society and contribute to sustainable development.

While the importance of sustainable learning ability in vocational education has been widely acknowledged, existing research primarily focuses on theoretical frameworks or isolated case studies. There is a significant lack of comprehensive studies that systematically address the interplay between school environments, teacher methodologies, and student factors in fostering sustainable learning. Moreover, despite governmental efforts to support vocational education in China, practical strategies for implementing sustainable learning frameworks in higher vocational colleges remain underdeveloped. Previous studies often highlight the challenges of outdated teaching methods, insufficient resources, and limited student motivation, but few offer actionable, evidence-based strategies tailored to the unique socio-economic and cultural context of Guangdong Province. This study seeks to bridge this gap by developing and evaluating targeted educational management strategies that align with the evolving needs of students and the demands of a rapidly changing labor market.

Research Objectives

1. To study the current and expected situations of students' sustainable learning ability in higher vocational colleges in Guangdong Province.
2. To develop educational management strategies to improve the students' sustainable learning ability in higher vocational colleges in Guangdong Province.
3. To explore the adaptability and feasibility of the educational management strategies to improve the students' sustainable learning ability in higher vocational colleges in Guangdong Province.

Research Questions

Based on the objective above, the following research questions were posed:

1. What are the current and expected situations of students' sustainable learning ability in higher vocational colleges in Guangdong Province?
2. How can the educational management strategies improve the students' sustainable learning ability in higher vocational colleges in Guangdong Province?
3. What is the level of the adaptability and feasibility of the educational management strategies to improve students' sustainable learning ability in higher vocational colleges in Guangdong Province?

LITERATURE REVIEW

Educational Management Strategies

Educational management strategies serve as critical tools for achieving educational objectives and enhancing quality. According to Li (2023), these strategies represent tailored action plans devised by administrators in response to specific educational contexts, highlights the need for comprehensive environmental analysis and flexible strategies to address dynamic educational conditions, emphasizing resource allocation, human resource management, and the integration of curriculum reforms. Liu (2008) and Jin (2023) underline principles like goal orientation, systematic optimization, and continuous improvement in strategy development. Implementation involves steps such as clarifying goals, analyzing current conditions, and leveraging feedback for refinement. Methods like SWOT and PEST analyses are also essential in shaping strategic approaches (Aguilar, 1967; Andrews, 1971).

Sustainable Learning Ability

Sustainable development is a multidimensional concept encompassing economic, social, and ecological dimensions. It aims to meet present needs without compromising the ability of future generations to fulfill their needs, promoting economic prosperity, social equity, and ecological integrity (Zhang, 2018). This principle, endorsed globally, demands integrated strategies that balance innovation, cooperation, and resource preservation to ensure long-term societal well-being and environmental health (Xi, 2020).

Theories of Sustainable Learning Ability

Sustainable learning ability refers to the capacity to acquire, apply, and adapt knowledge continuously over a lifetime, emphasizing self-directed and inquiry-based approaches. Key theories underline cognitive development, self-efficacy, and lifelong adaptability. Bandura's theory of self-efficacy highlights the role of confidence in one's ability to learn and adapt (Bandura, 1997). Kolb's experiential learning theory emphasizes learning through experience, reflection, and application, which supports lifelong learning (Kolb, 1984). Vygotsky's sociocultural theory underscores the importance

of social interaction and scaffolding in developing higher-order thinking skills, critical for sustainable learning (Vygotsky, 1978). These theories collectively inform educational strategies that foster lifelong adaptability and critical thinking in students.

Although sustainable learning ability for vocational education students in China are crucial and necessary, with the government supporting policies in various areas, there remain gaps in developing sustainable learning ability in vocational education students in China. These gaps can be observed in three main aspects: school environment, teachers, and students themselves.

School Environment: Many vocational institutions lack sufficient infrastructure, resources, and a supportive atmosphere for independent and inquiry-based learning. Classrooms are predominantly teacher-centered, limiting opportunities for active engagement and critical thinking. The absence of modern technological tools further hinders students' capacity for self-directed learning (Shi, 2018).

Teachers: Vocational educators often rely on traditional teaching methods, which are not conducive to developing long-term learning skills such as critical thinking, creativity, and problem-solving. Additionally, inadequate training in modern teaching strategies prevents teachers from fostering lifelong learning and adaptability in students (Chen, 2023).

Students: Many students perceive education as merely a pathway to employment rather than a foundation for lifelong learning. This mindset reduces their motivation for continuous learning, essential for navigating evolving societal and technological landscapes. Furthermore, students frequently lack critical thinking and self-directed learning skills, impeding their sustainable learning ability (Shan, 2011).

Higher Vocational Colleges and their Teaching Management

Higher vocational colleges, a critical component of China's higher education system, focus on cultivating applied and technical talents to meet societal and economic demands. These institutions typically offer three-year programs emphasizing professional skills, practical ability, and innovation to produce workforce-ready graduates. Teaching management in higher vocational colleges requires aligning curriculum design with industry needs, fostering school-enterprise collaboration, and leveraging modern technology for efficiency and quality improvement (Cai, 2017; Lai, 2021). Furthermore, students in these institutions are characterized by their strong practical abilities, professional ethics, and adaptability to workplace challenges (Chen & Kong, 2019; Wu, 2024).

Relevant Research

The study of educational management strategies to enhance sustainable learning ability in higher vocational colleges and universities, particularly in Guangdong Province, has been explored through various approaches. Xu (2006) emphasized fostering lifelong learning attitudes through vocational ethics, mental health education, and innovation in conducive environments. Yang (2014) focused on reconstructing accounting curricula to enhance basic, professional, and innovative learning competencies, with an emphasis on evaluation and program implementation. Hu and Chen (2014) introduced the "5C" model (confidence, ability, creativity, continuous learning, and career planning) to promote holistic student development. Hao (2017) focused on cultivating independent English learning ability by addressing motivation, goals, and teaching methods. Sun and Li (2020) explored factors influencing independent learning and proposed strategies to prepare students for academic and career challenges. Wang and Wang (2024) advocated for systematic self-learning design, problem-driven motivation, and reflective practices in response to new curriculum reforms. Li and Liu (2023) examined the role of digital platforms in enhancing independent learning, suggesting the optimization of curricula, teaching methods, and evaluation mechanisms. In conclusion, researchers agree on the importance of enhancing sustainable learning ability and suggest comprehensive strategies to align students' skills with societal and economic needs.

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

RESEARCH METHODOLOGY

Research Design

This study utilized a mixed-methods research design to enhance students' sustainable learning ability in higher vocational colleges in Guangdong Province. It involved three stages. First, the current and expected states of students' sustainable learning ability were assessed through document reviews, in-depth interviews with eight experts, and surveys of 384 students from four colleges, using validated instruments and a five-point Likert scale. Second, educational management strategies were developed using SWOT analysis, a TOWS matrix, and focus group discussions with eight experts. Third, the strategies' suitability and feasibility were evaluated by five experts using a Likert scale. Data were analyzed with descriptive statistics and the Modified Priority Needs Index ($PNI_{Modified}$) to ensure comprehensive and actionable findings.

The Population

The population for this study consisted of students enrolled in higher vocational colleges in Guangdong Province, China. Guangdong Province, known for its significant economic development and industrial diversity, is home to 93 higher vocational colleges, hosting approximately 1.254 million students and 50,000 staff members. These institutions cater to a wide range of disciplines, emphasizing practical skills and workforce readiness.This study employs a mixed-method approach, incorporating qualitative research through field studies with in-depth interviews and focus groups, as well as quantitative research through survey methods. Population and Sampling: Guangdong Province includes 93 higher vocational colleges with 1.254 million students

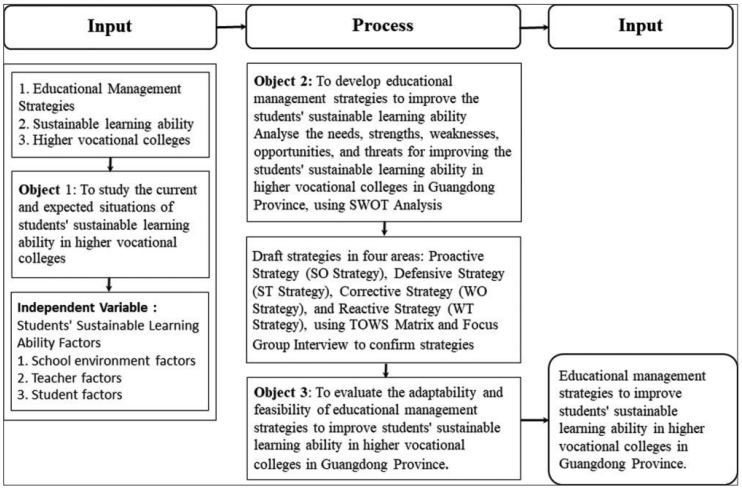

Figure 1. Summarize the research framework

and approximately 50,000 staff. A purposive sample of 384 students from four colleges representing the province's regions (Pearl River Delta, Eastern, Western, and Northern Guangdong) was selected. The sample size, 5% of the population, was determined using Krejcie and Morgan's (1970).

Research Procedure

The research process is divided into three main steps:

Stage 1: **Study the current and expected situation of students' sustainable learning ability in higher vocational colleges in Guangdong Province**

The involvement was conducted research in three substeps as follows:

1. Document Review

The researchers conducted a comprehensive review of documents, publications, electronic media, and research studies to analyze the current and desired states of students' sustainable learning ability in higher vocational colleges in Guangdong Province. Content analysis was used to extract key insights.

2. In-depth Interviews

To explore the factors influencing students' sustainable learning ability, in-depth interviews were conducted with eight purposively sampled experts, including teachers and teaching administrators from four higher education institutions. Selection criteria included: At least five years of institutional experience, Knowledge of institutional development plans, teaching management, and student development, Willingness to participate in structured, recorded interviews.

3. Research Instrument

An interview form and a questionnaire were used for collecting the data.

Interview Form

The interview form was designed based on the research framework, comprised:

Part 1: BasicInformation-Demographicsofrespondents.
Part 2: Key Topics-Perspectives on factors influencing sustainable learning ability.
Part 3: Additional Suggestions-Open-ended questions for further recommendations.

The interview form was validated by the dissertation chair and advisory committee to ensure accuracy and completeness.

Questionnaire

The questionnaire was also used to survey opinions on the current and expected situations of students' sustainable learning ability. The questionnaire was developed based on the research framework. It was validated for content by five experts using the Index of Item-Objective Congruence (IOC), with values ranging from 0.60 to 1.00. A pilot test showed a discrimination power between 0.42 and 0.89 and a reliability score of 0.88.

The questionnaire consisted of the following parts:

Part 1: Demographic information (gender, age, education, professional background).
Part 2: Assessment of the current and expected situations of students' sustainable learning ability in Guangdong Province, focusing on three aspects: (i) School environment, (ii) Teachers, and (iii) Students.

4. Data Collection and Analysis

Interviews were scheduled at convenient times, recorded, and analyzed using content analysis to identify trends and summarize the current and expected situations regarding sustainable learning ability in Guangdong's higher vocational colleges.

5. Population and Sampling

Guangdong Province includes 93 higher vocational colleges with 1.254 million students and approximately 50,000 staff. A purposive sample of 384 students from four colleges representing the province's regions (Pearl River Delta,

Eastern, Western, and Northern Guangdong) was selected. The sample size, 5% of the population, was determined using Krejcie and Morgan's (1970)

6. Data Collection

A letter of request from the Graduate School of Bansomdejchaopraya Rajabhat University was submitted to collect data from 384 students across four higher vocational colleges in Guangdong Province.

7. Data Interpretation and Analysis

The data were analyzed using a five-point Likert scale, with scores ranging from 1 (lowest) to 5 (highest). The interpretation follows Best's (1984) criteria:

4.51–5.00: Highest level
3.51–4.50: High level
2.51–3.50: Moderate level
1.51–2.50: Low level
1.00–1.50: Lowest level

Descriptive statistics, including frequency, percentage, mean, and standard deviation, were used to analyze the demographic variables and the current and expected situations of students' sustainable learning ability. The Modified Priority Needs Index ($PNI_{Modified}$). To identify the necessary needs using the $PNI_{Modified}$ formula (Wongwanich, 2005), we used the following formula:

$PNI_{Modified} = (I - D)/D$

Where: I refers to the expected condition of students' sustainable learning ability

D refers to the current condition of students' sustainable learning ability

Stage 2: Develop Educational Management Strategies to Improve Students' Sustainable Learning Ability in Higher Vocational Colleges

The process involves drafting strategies by analyzing weaknesses, strengths, threats or obstacles, and opportunities to improve students' sustainable learning ability in higher vocational colleges in Guangdong Province. Data were analyzed by calculating the $PNI_{Modified}$ value, and the drafted strategies were reviewed and refined by experts. A group of 12 experts, each knowledgeable and experienced in strategy and the development of students' sustainable learning ability, conducted a focus group discussion to exchange opinions on the suitability of each aspect of the strategies.

1. Target Group

The target group for developing strategies to improve students' sustainable learning in higher education institutions included 4 full-time teachers and 4 instructional administrators from four institutions. The teachers and administrators had to meet the following criteria: 1) more than five years of experience at the institution, and 2) familiarity with the school's development plan, teaching management, and student development. Additionally, 4 experts with over 15 years of experience, senior titles, and leadership roles in higher education were selected for their expertise in strategy formulation, sustainable development, and students' sustainable learning ability.

2. Data Collection Process for objective 2

The development process is divided into four steps as follows:

2.1 Analysis of Needs, Strengths, and Weaknesses

Conduct an analysis to identify the strengths, weaknesses, and essential needs for improving students' sustainable learning ability in higher vocational colleges in Guangdong Province.

2.2 Analysis of Opportunities and Threats

Examine the opportunities and threats related to improving students' sustainable learning ability in higher vocational colleges in Guangdong Province.

2.3 Drafting Educational Management Strategies

Utilize the findings from steps 2.1 and 2.2 to draft the educational management strategies. This involves:

- Conducting a SWOT Analysis based on strengths, weaknesses, opportunities, and threats.
- Developing a TOWS Matrix.
- Presenting the draft strategies to the dissertation advisor and committee members for review and approval of their appropriateness.

2.4 Developing the Educational Management Strategies

Conduct a Focus Group Discussion with eight experts selected through purposive sampling. Analyze the data using Content Analysis to refine and finalize the educational management strategies aimed at improving students' sustainable learning ability in higher vocational colleges in Guangdong Province.

Stage 3. Evaluate the suitability and feasibility of educational management strategies to improve the students' sustainable learning ability in higher vocational colleges

1. Research Instrument

The instrument consisted of the following parts:

1. Target Group for evaluation Strategies

The evaluation of the integration strategy of production and education involved five experts from the Shenzhen Institute of Vocational Technology and Heyuan Institute of Vocational Technology. These experts significantly influence strategy formulation, sustainable development, student learning ability, talent cultivation, and education management in higher vocational institutions. The experts' qualifications include: (i) Over 15 years of work experience, (ii) Senior professional titles, and (iii) Leadership positions at senior levels.

2. Evaluation Form

The evaluation employed a five-point Likert scale: "Very High," "High," "Medium," "Low," and "Very Low." The evaluation form was designed to collect data for Objective 3 and assess the suitability and feasibility of educational management strategies to enhance students' sustainable learning ability in higher vocational institutions. Five experts from Shenzhen Vocational and Technical University and Heyuan Vocational and Technical College participated in the evaluation. The evaluation form consists of two parts: (i) Expert Information: Includes work position, work experience, educational background, and academic title. (ii) Strategy Evaluation: Focuses on assessing the educational management strategies to improve the students' sustainable learning ability in higher vocational colleges in Guangdong Province. The criteria for interpretation follow a five-point Likert scale:

5: Highest adaptability and feasibility
4: High adaptability and feasibility
3: Moderate adaptability and feasibility
2: Low adaptability and feasibility
1: Lowest adaptability and feasibility

The average values were interpreted as:
4.50–5.00: Highest level
3.50–4.49: High level
2.50–3.49: Moderate level
1.50–2.49: Low level
1.00–1.49: Lowest level

3. Data Collection

The data collection for Aim 3, which evaluates the suitability and feasibility of educational management strategies to enhance students' sustainable learning ability in higher vocational colleges in Guangdong Province, was conducted as follows:

3.1 Requesting Expert Evaluation

The researcher obtained a formal letter from the Graduate School of Bansomdejchaopraya Rajabhat University to invite five experts from Shenzhen University of Vocational Technology and Heyuan Institute of Vocational Technology to participate in the evaluation.

3.2 Distribution of Evaluation Forms

Evaluation forms were distributed to the five experts. The researcher coordinated a suitable time and place to provide instructions, ensured the experts completed the forms, and collected all forms with a 100% response rate.

3.3 Expert Assessment

The experts completed the evaluation forms based on the provided criteria.

4. Data Analysis

The researchers summarized and analyzed the evaluation results to assess the strategies' adaptability and feasibility.

RESEARCH RESULTS

Current and Expected Situations of Students' Sustainable Learning Ability

The results of examining the current and expected situations of students' sustainable learning ability in higher vocational colleges in Guangdong Province are summarized in Tables 1 and 2.

Demographics

The analysis of respondents' personal information is summarized in Table 1. An examination of the sample demographics, as presented in Table 1, reveals a balanced distribution across key variables, including school, gender, and academic year. The study included a total of 384 respondents. The largest group comprised students from Shenzhen Vocational and Technical University, accounting for 42.70% (164 individuals), followed by Maoming Vocational and Technical College and Heyuan Vocational and Technical College, each contributing 22.40% (86 individuals). In terms of gender, the majority of respondents were female, representing 41.40% (159 individuals). Regarding academic year distribution, first-year students constituted the largest proportion at 38.50% (148 individuals), followed by second-year students at 33.30% (128 individuals), and third-year students at 28.10% (108 individuals).

The results of the first research objective, to examine the current and expected situations of students' sustainable learning ability in higher vocational colleges in Guangdong Province are presented in Table 2.

According to Table 2, the sustainable learning ability of students in higher vocational colleges in Guangdong Province are influenced by three key factors: school environment, teacher, and student factors. The current state of these ability was rated as high, with an overall mean score of 3.69. Among

Table 1. Analysis of the personal information and participants

Personal Information		Frequency	Percentage
Total		**384**	**100**
1. School:	1. Shenzhen Vocational and Technical University	164	42.70
	2. Shanwei Vocational and Technical College	48	12.50
	3. Maoming Vocational and Technical College	86	22.40
	4. Heyuan Vocational and Technical College	86	22.40
2. Gender:	1. Male	159	41.40
	2. Female	225	58.60
3. Grade:	1. First year of university	148	38.50
	2. Second year of university	128	33.30
	3. Third year of university	108	28.10

Table 2. Current situation and expected situation of students' sustainable learning ability

Students' sustainable learning ability	Current Situation		Expected condition				PNI	Rank
	M	*SD*	Level	*M*	*SD*	Level		
1. School environment factors	3.77	0.62	High	4.53	0.48	Highest	0.20	3
2. Teacher factors	3.67	0.64	High	4.51	0.52	Highest	0.23	2
3. Student factors	3.64	0.48	High	4.51	0.43	Highest	0.24	1
Total of all factors	3.69	0.49	High	4.52	0.39	Highest	0.22	

the factors, the school environment had the highest mean score (3.77), while student factors had the lowest (3.64).

In the expected state, the sustainable learning ability were rated higher, with an overall mean score of 4.52. The school environment again scored the highest (4.53), followed by teacher and student factors, both with a mean score of 4.51. The Modified Priority Needs Index ($PNI_{Modified}$) for these ability was calculated as 0.22, with student factors showing the highest $PNI_{Modified}$ value (0.24), followed by teacher factors (0.23), and school environment factors (0.20).

These findings identify student and teacher factors as weaknesses requiring strategic improvement, while the school environment is recognized as a strength to be reinforced. The results provide essential insights for drafting educational management strategies aimed at enhancing students' sustainable learning ability in higher vocational colleges in Guangdong Province.

Developing Educational Management Strategies

Drafting the Educational Management Strategies to Improve Students' Sustainable Learning Ability in Higher Vocational Colleges in Guangdong Province. The process begins with an analysis using the TOWS Matrix, The results of the TOWS Matrix analysis are then used to draft the educational management strategies aimed at improving students' sustainable learning ability. This process integrates the analysis of internal and external environments, as well as content analysis from questionnaires assessing the current situation and expected situation of students' sustainable learning ability in higher vocational colleges in Guangdong Province, Subsequently, the strategies are reviewed for suitability by experts through a Focus Group Discussion (Table 3).

According to Table 3, the draft educational management strategies to improve students' sustainable learning ability in

Table 3. Strategic analysis data using the TOWS matrix

	Strategy: S S1: Schools should offer diverse learning resources and tools, including libraries, equipment, networks, online platforms, and field trips, to cater to students' varied learning needs and preferences. S2: Teachers should use diverse evaluation methods, provide timely feedback, and foster a supportive and collaborative environment to build trust, respect, and effective teacher-student relationships. S3: Students should think independently, dare to question, and critically analyze to form their own opinions and judgments.	**Weakness :W** W1: The school should integrate community learning resources to effectively enhance the quality of students' education. W2: Teachers should adopt diverse teaching methods and strengthen teamwork to enhance students' interest and ability in independent learning W3: Students should overcome the difficulties and setbacks in the learning process, persevere in learning, actively seek help, and constantly improve their learning ability.
Opportunity : O O1: The state provides policy support for vocational education, which helps schools strengthen education management and enhance students' sustainable independent learning ability. O2: The shortage of skilled personnel in society and the broad employment prospects of students help to motivate students' sustainable independent learning ability. O3: The progress of science and technology brings more new teaching equipment and teaching methods, which helps schools to cultivate students' sustainable independent learning ability.	**SO Strategy** 1. Innovative Learning Ecosystem Strategy 2. Empowered Teaching and Learning Strategy 3. Policy-Driven Critical Thinking Development Strategy	**WO Strategy** 1. Collaborative Vocational Education Enhancement Strategy 2. Integrated Teaching and Policy Advancement Strategy 3. Technology-Driven Resilience Enhancement Strategy
Threat: T T1 Increasing competition in the market increases the pressure on schools to enhance students' sustainable independent learning ability. T2 Higher vocational colleges and universities are affected by the lack of student sources, which affects the quality of education in schools and the sustainable independent learning ability of students. T3 The continuous change of science and technology has put forward new challenges to the cultivation of students' sustainable independent learning ability.	**ST Strategy** 1. Future-Ready Learning Ecosystem Strategy. 2. Resilient Teaching and Feedback Strategy 3. Dynamic Teaching and Feedback Strategy	**WT Strategy** 1. Community-Engaged Education Enhancement Strategy 2. Resilient Teaching and Feedback Strategy 3. Dynamic Teaching and Feedback Strategy

higher vocational colleges in Guangdong Province include the following:

- Proactive Strategies (SO): A combination of Strengths (S) and Opportunities (O), comprising 3 strategies and 4 proposed projects to support the strategies
- Corrective Strategies (WO): A combination of Weaknesses (W) and Opportunities (O), comprising 3 strategies and 4 proposed projects to support the strategies.
- Defensive Strategies (ST): A combination of Strengths (S) and Threats (T), comprising 3 strategies and 4 proposed projects to support the strategies.
- Defensive Strategies (WT): A combination of Weaknesses (W) and Threats (T), comprising 3 strategies and 4 proposed projects to support the strategies.

The details are presented in Table 4.

Adaptability and Feasibility of the Educational Management Strategies

The educational management strategy for improving students' sustainable learning ability in higher vocational colleges and universities in Guangdong Province is divided into 12 Strategy and contains 48 Proposed Projects to Support

Table 4. Educational management strategies using TOWS matrix analysis

	Opportunities	**Threats**
Strengths	**SO Strategy** **1. Innovative Learning Ecosystem Strategy** Proposed Projects to Support the Strategy: 1.1 Smart Learning Ecosystem Development Project 1.2 Policy-Driven Vocational Education Enhancement Program 1.3 Learning Resources Optimization Initiative 1.4 Teacher Innovation Training Program **2. Empowered Teaching and Learning Strategy** Proposed Projects to Support the Strategy: 2.1 Digital Evaluation and Feedback System Development Project 2.2 Tech-Driven Collaborative Teaching Program 2.3 Smart Classroom Implementation Initiative\ 2.4 Innovative Teaching Practices Workshop **3. Policy-Driven Critical Thinking Development Strategy** Proposed Projects to Support the Strategy: 3.1 Vocational Critical Thinking Curriculum Enhancement Program 3.2 Independent Learning and Judgment Workshop Series 3.3 Policy-Supported Vocational Learning Labs 3.4 Critical Thinking Mentorship Program	**ST Strategy** **1. Future-Ready Learning Ecosystem Strategy** Proposed Projects to Support the Strategy: 1.1 Inclusive Learning Resource Access Initiative 1.2 Collaborative Recruitment and Outreach Program 1.3 Quality Assurance and Retention Enhancement Project 1.4 Resource-Based Learning Campaign **2. Resilient Teaching and Feedback Strategy** Proposed Projects to Support the Strategy: 2.1 Continuous Professional Development Program for Teachers 2.2 Dynamic Assessment and Feedback System Initiative 2.3 Teacher-Student Collaboration Enhancement Project 2.4 Technology-Adaptive Teaching Practices Workshop **3. Dynamic Teaching and Feedback Strategy** Proposed Projects to Support the Strategy: 3.1 Independent Thinking and Market Awareness Program 3.2 Competitive Edge Learning Modules 3.3 Industry Collaboration and Internship Program 3.4 Student-Centered Learning Enhancement Project
Weaknesses	**WO Strategy** **1. Collaborative Vocational Education Enhancement Strategy** Proposed Projects to Support the Strategy: 1.1 Community Learning Resource Partnership Program 1.2 Policy-Driven Community Engagement Initiative 1.3 Vocational Skill Development and Community Internship Program 1.4 Community-Based Education Resource Hub **2. Integrated Teaching and Policy Advancement Strategy** Proposed Projects to Support the Strategy: 2.1 Diverse Teaching Methods Training Program 2.2 Team-Based Teaching Innovation Initiative 2.3 Policy-Driven Teaching Collaboration Network 2.4 Student-Centered Learning Projects **3. Technology-Driven Resilience Enhancement Strategy** Proposed Projects to Support the Strategy: 3.1 Resilience and Perseverance Development Program 3.2 Tech-Integrated Learning Support Network 3.3 Adaptive Learning Tools Implementation 3.4 Mentorship and Motivation Campaign	**WT Strategy** **1. Community-Engaged Education Enhancement Strategy** Proposed Projects to Support the Strategy: 1.1 Community Outreach and Resource Sharing Program 1.2 Targeted Recruitment Campaigns 1.3 Community-Based Learning and Internship Initiative 1.4 Educational Resource Hub Development **2. Innovative Teaching and Collaboration Strategy** Proposed Projects to Support the Strategy: 2.1 Teacher Training on Emerging Technologies Program 2.2 Collaborative Teaching Innovation Workshops 2.3 Technology-Enhanced Independent Learning Support System 2.4 Cross-Disciplinary Team Teaching Initiatives **3. Resilience and Market-Ready Learning Strategy** Proposed Projects to Support the Strategy: 3.1 Resilience-Building Support Program 3.2 Career and Competency Development Workshops 3.3 Individualized Learning Support Network 3.4 Student Engagement and Motivation Campaign

the Strategy. A total of 8 experts were invited to evaluate the adaptability and feasibility of the educational management strategies for improving students' sustainable learning ability in higher vocational institutions in Guangdong Province. The data of the analyzed results are expressed in the form of mean and standard deviation, as shown in Table 5.

According to Table 5, the data show that the experts' overall evaluation of the adaptability and feasibility of the strategy is very high. The overall evaluation of feasibility is the highest ($M = 4.71$), while the overall evaluation of adaptability is also at a very high level ($M = 4.59$), indicating that the strategy demonstrates both high adaptability and feasibility.

DISCUSSION

Current and Expected Situations of Students' Sustainable Learning Ability

The findings of this study provide valuable insights into the current and expected situations of students' sustainable learning abilities in higher vocational colleges in Guangdong Province. These abilities were categorized into three primary components: school environment factors, teacher factors, and student factors. Each component is integral to fostering sustainable learning and exhibits distinct strengths and areas for improvement.

School environment factors

The study revealed that school environment factors significantly contribute to sustainable learning. The availability of diverse resources, such as libraries, networks, online platforms, and field trips, aligns with the findings of Kim et al. (2019), who emphasized the role of varied resources in creating an inclusive learning environment. Similarly, Zhang and Li (2020) highlighted the advantages of integrating multiple learning modalities to enhance student engagement. Despite these strengths, a critical gap exists in the utilization of community-based learning resources. Liu et al. (2018) suggest that community partnerships could bridge the divide between theoretical knowledge and practical applications. Addressing this gap requires schools to strengthen collaboration with local businesses, cultural institutions, and NGOs to provide practical exposure for students.

Teacher factors

Teacher factors emerged as a critical area requiring urgent attention. While strengths such as the use of diverse evaluation methods, timely feedback, and fostering safe teacher-student relationships were noted, significant weaknesses persist. The limited adoption of innovative teaching strategies, such as flipped classrooms and blended learning, and insufficient teacher collaboration were identified as pressing concerns. These findings corroborate Li and Wang's (2021a) assertion that innovative strategies enhance student engagement and autonomy. Johnson and Taylor (2020) further underscored the importance of teacher collaboration in promoting self-directed learning. Addressing these weaknesses calls for professional development programs focused

Table 5. Evaluation of adaptability and feasibility of the educational management strategies

Assessment checklist	Adaptability			Feasibility		
	M	*SD*	Level	*M*	*SD*	Level
SO Strategy						
1. Innovative Learning Ecosystem Strategy	4.88	0.35	highest	4.75	0.46	highest
2. Empowered Teaching and Learning Strategy	4.38	0.52	high	4.25	0.46	high
3. Policy-Driven Critical Thinking Development Strategy	4.75	0.46	highest	4.75	0.46	highest
Total aspects 1	4.67	0.44	highest	4.58	0.46	highest
ST Strategy						
1. Future-Ready Learning Ecosystem Strategy	4.75	0.46	highest	4.63	0.52	highest
2. Resilient Teaching and Feedback Strategy	4.88	0.35	highest	4.63	0.52	highest
3. Dynamic Teaching and Feedback Strategy	4.88	0.35	highest	4.63	0.52	highest
Total aspects 2	4.84	0.39	highest	4.63	0.52	highest
WO Strategy						
1. Collaborative Vocational Education Enhancement Strategy	4.13	0.35	high	4.13	0.35	high
2. Integrated Teaching and Policy Advancement Strategy	4.75	0.46	highest	4.63	0.52	highest
3. Technology-Driven Resilience Enhancement Strategy	5.00	0.00	highest	4.88	0.35	highest
Total aspects 3	4.63	0.27	highest	4.55	0.41	highest
WT Strategy						
1. Community-Engaged Education Enhancement Strategy	4.63	0.52	highest	4.63	0.52	highest
2. Innovative Teaching and Collaboration Strategy	4.75	0.46	highest	4.50	0.54	highest
3. Resilience and Market-Ready Learning Strategy	4.75	0.46	highest	4.63	0.52	highest
Total aspects 4	4.71	0.48	highest	4.59	0.53	highest
Total all aspects	4.71	0.40	highest	4.59	0.48	highest

on equipping teachers with innovative pedagogical tools and fostering collaborative practices through workshops and training sessions.

Student factors

Student factors were identified as the most significant weakness, with a Priority Needs Index (PNIModified = 0.24), highlighting their critical role in sustainable learning. Students exhibited strong critical thinking and independent judgment skills, consistent with the observations of Brown et al. (2020). However, their resilience, help-seeking behaviors, and ability to overcome challenges were notably weak. Johnson and Lee (2019) emphasized resilience as a key attribute for navigating academic challenges. To address these issues, resilience development programs and peer mentoring systems should be implemented to build emotional strength and mutual support among students. Additionally, fostering critical thinking through curriculum-integrated activities and providing personalized feedback can further enhance students' self-improvement efforts.

Developing Educational Management Strategies to Improve the Students' Sustainable Learning Ability

The development of educational management strategies to improve students' sustainable learning ability in higher vocational colleges in Guangdong Province provides a comprehensive framework for addressing both internal weaknesses and external challenges. The strategies, categorized as SO (proactive), ST (defensive), WO (corrective), and WT (mitigative), are aimed at leveraging institutional strengths, harnessing external opportunities, and addressing systemic challenges.

Proactive strategies (SO strategies)

The proactive strategies aim to capitalize on the inherent strengths of higher vocational colleges while leveraging external opportunities, such as advancements in technology and supportive government policies.

Innovative learning ecosystem strategy

This strategy integrates diverse resources like libraries, online platforms, and technology to establish a dynamic learning environment. Research by Kim et al. (2019) emphasizes that inclusive learning environments benefit from varied resources, while Zhang and Li (2020) underline the importance of technological integration in promoting sustainable learning.

Outcome: A robust and inclusive ecosystem facilitates personalized learning pathways, aligning with the demands of 21st-century education.

Empowered teaching and learning strategy

This strategy equips educators with innovative methods, such as flipped classrooms and blended learning, while fostering collaboration between teachers and students. Li and Wang (2021a) highlighted the importance of such teaching strategies in enhancing engagement and autonomy, and Johnson and Taylor (2020) emphasized the role of teacher collaboration.

Outcome: This strategy ensures modernized teaching-learning dynamics that adapt to evolving educational challenges.

Policy-driven critical thinking development strategy

By aligning institutional practices with government policies, this strategy fosters critical thinking and problem-solving skills. Liu et al. (2018) and Brown et al. (2020) identified critical thinking as essential for career readiness and emphasized the value of policy alignment. As a result of this,

Outcome: Students develop enhanced market competitiveness and are better prepared academically and professionally.

Defensive strategies (ST Strategies)

The defensive strategies are designed to mitigate external threats while reinforcing institutional capabilities.

Future-ready learning ecosystem strategy

By integrating advanced technology and modern infrastructure, this strategy prepares students for future challenges. Zhang and Li (2020) highlighted the role of technology in equipping students with future-ready skills, while Kim et al. (2019) emphasized the adaptability fostered by diverse learning environments.

Outcome: Students develop skills that align with rapidly changing market demands, enhancing their employability.

Resilient teaching and feedback strategy

This strategy focuses on developing teaching methods and real-time feedback mechanisms to build student resilience. Johnson and Taylor (2020) emphasized the importance of feedback in fostering resilience, while Li and Wang (2021a) discussed adaptive teaching methods.

Outcome: Students thrive under external pressures, gaining resilience and adaptability in both academic and professional contexts.

Dynamic teaching and feedback strategy

Addressing external threats like technological disruptions, this strategy emphasizes adaptive teaching and continuous assessment. Liu et al. (2018) and Brown et al. (2020) noted the importance of dynamic feedback in enhancing critical thinking and adaptability.

Outcome: Institutions maintain high educational standards despite external challenges through a flexible and responsive framework.

Corrective strategies (WO strategies)

The corrective strategies leverage external opportunities to address institutional weaknesses, particularly in resource allocation and pedagogical diversity.

Collaborative vocational education enhancement strategy

This strategy strengthens partnerships with local industries and organizations to address resource gaps and improve practical learning. Zhang and Li (2020) and Kim et al. (2019) emphasized the benefits of industry collaboration and external partnerships.

Outcome: Students gain practical skills, enhanced learning environments, and stronger industry connections.

Integrated teaching and policy advancement strategy

By aligning teaching practices with supportive government policies, this strategy addresses gaps in teaching diversity and collaboration. Liu et al. (2018) and Li and Wang (2021b) noted the importance of policy-driven reforms in improving pedagogical practices.

Outcome: Institutions implement innovative teaching methods and align their goals with government priorities, fostering better learning outcomes.

Technology-driven resilience enhancement strategy

This strategy integrates digital tools to improve adaptability in teaching and learning. Brown et al. (2020) and Johnson and Taylor (2020) emphasized technology's role in fostering adaptive learning environments.

Outcome: A technologically advanced ecosystem that supports self-directed learning and resilience development.

Mitigative strategies (WT strategies)

The mitigative strategies focus on addressing institutional weaknesses while counteracting external threats.

Community-engaged education enhancement strategy

By collaborating with local organizations, this strategy overcomes resource limitations and fosters experiential learning. Liu et al. (2018) and Zhang and Li (2020) highlighted the benefits of community partnerships in enriching learning environments.

Outcome: A community-integrated approach enhances resource availability and practical exposure for students.

Innovative teaching and collaboration strategy

This strategy addresses the lack of teaching adaptability and teamwork by promoting collaborative models and pedagogies like blended and problem-based learning. Li and Wang (2021b) and Johnson and Taylor (2020) highlighted the importance of diverse teaching methods and teacher collaboration.

Outcome: Improved teaching quality and collaboration empower students to tackle systemic challenges.

Resilience and market-ready learning strategy

This strategy integrates resilience-building programs and career readiness initiatives to prepare students for competitive environments. Brown et al. (2020) and Kim et al. (2019) emphasized the significance of resilience and critical thinking for student success.

Outcome: Students develop both personal growth and market-relevant skills, equipping them for real-world challenges.

Adaptability and Feasibility of the Educational Management Strategies

Results of the adaptability and feasibility of Educational Management Strategies to improve students' sustainable learning ability in Higher Vocational Colleges in Guangdong Province. The strategies were assessed by experts in the field, which included educators and administrators with significant experience in higher education. Their feedback provided insights into the practicality of the proposed strategies that received a high feasibility rating (M=4.71), indicating that experts found them practical and implementable within the current educational context. The adaptability of the strategies was also rated positively (M=4.59), suggesting that these strategies could be tailored to fit various educational settings and student needs. Overall, the educational management strategies were deemed highly adaptable and feasible. This outcome is attributed to their development through a rigorous research process that involved multiple stages. These stages included synthesizing relevant documents, academic articles, and research studies, as well as employing questionnaires to assess the current state and desired improvements in students' sustainable learning ability. The draft strategies were formulated based on these findings and subsequently refined through focus group discussions (FGDs) with experts. Recommendations and feedback gathered from the discussions were integrated to enhance the strategies, thereby increasing their reliability and relevance. Finally, the strategies underwent a thorough evaluation by experts with extensive knowledge and experience in strategy development and the enhancement of sustainable learning ability. This comprehensive approach ensured that the developed strategies are both credible and practical for real-world implementation. Studies such as those by Zhang et al. (2021) and Liu et al. (2019) emphasize the importance of expert-driven evaluation processes in ensuring the adaptability and feasibility of educational strategies. Furthermore, research by Kim and Park (2020) highlights the significance of iterative feedback and refinement processes in creating effective educational frameworks. The high levels of adaptability and feasibility achieved in this study demonstrate the strategies' potential to address the needs and challenges of sustainable learning in higher vocational institutions, aligning with national education policies and global trends in lifelong learning and skills development.

CONCLUSION

The following recommendations can be presented based on the findings of the study:

1. Recommendations for Applying Research Findings
   a. Develop Strategic Educational Policies: Utilize the findings to create policies that prioritize integrating

community learning resources and enhancing teacher training programs to address identified weaknesses and improve sustainable learning ability.

b. Implement Professional Development Programs: Design workshops and training sessions for teachers focusing on innovative teaching methods, such as flipped classrooms and blended learning, to stimulate students' interest and foster independent learning.

c. Strengthen Student Support Systems: Establish student support programs that focus on resilience-building, problem-solving skills, and access to diverse learning resources to address the challenges students face in their learning process.

2. Recommendations for Future Research

a. Explore Interventions for Weak Areas: Investigate specific strategies or interventions to address identified weaknesses, such as integrating community learning resources and adopting innovative teaching methods, to enhance sustainable learning ability.

b. Longitudinal Studies: Conduct longitudinal research to evaluate the long-term impact of improved teaching strategies, community engagement, and resilience-building initiatives on students' sustainable learning outcomes.

c. Cross-Context Comparisons: Expand the scope to compare sustainable learning ability across different provinces or educational systems, providing insights into contextual influences and best practices for broader applications.

In conclusion, the development and implementation of targeted educational management strategies are critical to fostering sustainable learning ability among students in higher vocational colleges in Guangdong Province. These strategies address both systemic weaknesses and external challenges while leveraging strengths and opportunities. By focusing on enhancing school environments, empowering teachers, and supporting students, the proposed frameworks create a pathway for lifelong learning and adaptability. The high adaptability and feasibility ratings from experts underscore the potential of these strategies to bridge existing gaps and meet the demands of modern education and labor markets. Future research can further refine these strategies, ensuring their relevance across diverse educational contexts and evolving societal needs. Ultimately, this work contributes to the broader goal of aligning vocational education with sustainable development and global educational standards.

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