GUIDELINES FOR IMPROVING DIGITAL EDUCATION INITIATIVES IN VOCATIONAL COLLEGES IN YUNNAN

ZHANG YUEXING

Thesis Title   Guideline for Improving Digital Education Initiatives in Vocational Colleges in Yunnan

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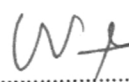
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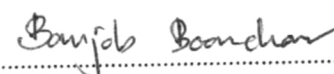
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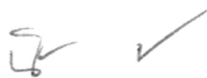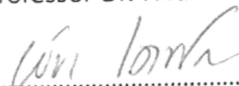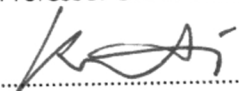.. Dean of Graduate School
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ABSTRACT

The objectives of this research were: 1) to study the current situation of digital education initiatives in vocational colleges in Yunnan, 2) to study the guidelines for improving digital education initiatives in vocational colleges in Yunnan, and 3) to evaluate the adaptability and feasibility of the guidelines improving digital education initiatives in vocational colleges in Yunnan. The population was 358 administrators from 8 vocational colleges in Yunnan. Research instruments include: 1) questionnaire, 2) semi-structured interview, and 3) evaluation form. Data analysis by using percentage, mean, standard deviation and content analysis.

Results indicate a high level of current digital education initiatives across six dimensions. Thirty-seven guidelines were identified to enhance the initiatives, emphasizing resource improvement, technological integration, systematic guidance, digital literacy, financial support, and policy alignment. Administrators perceived these guidelines as highly adaptable and feasible. Overall, the findings suggest robust support for advancing digital education initiatives in Yunnan's vocational colleges.

Keywords: Digital Education Initiatives, Vocational Colleges, Guidelines for Regional Improving

ชื่อเรื่อง	แนวทางการพัฒนาความคิดริเริ่มทางการศึกษาบนโลกดิจิทัลในวิทยาลัยอาชีวศึกษาในมณฑลยูนนาน
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ปีการศึกษา	2566

บทคัดย่อ

การวิจัยครั้งนี้มีวัตถุประสงค์ 1) เพื่อศึกษาสภาพปัจจุบันของความคิดริเริ่มทางการศึกษาบนโลกดิจิทัลในวิทยาลัยอาชีวศึกษาในมณฑลยูนนาน 2) เพื่อศึกษาแนวทางการพัฒนาความคิดริเริ่มทางการศึกษาบนโลกดิจิทัลในวิทยาลัยอาชีวศึกษาในมณฑลยูนนาน และ 3) เพื่อประเมินความเหมาะสมและความเป็นไปได้ของแนวทางการพัฒนาความคิดริเริ่มทางการศึกษาบนโลกดิจิทัลในวิทยาลัยอาชีวศึกษาในมณฑลยูนนาน ประชากรในการวิจัยครั้งนี้ ได้แก่ ผู้บริหารวิทยาลัยอาชีวศึกษาในมณฑลยูนนาน จำนวน 8 แห่ง รวมทั้งสิ้น 358 คน เครื่องมือที่ใช้ในการวิจัย ได้แก่ แบบสอบถาม แบบสัมภาษณ์แบบมีโครงสร้าง และแบบประเมิน สถิติที่ใช้ในการวิจัย ได้แก่ ค่าร้อยละ ค่าเฉลี่ย ส่วนเบี่ยงเบนมาตรฐาน และการวิเคราะห์เนื้อหา

ผลการวิจัยพบว่า สภาพปัจจุบันของความคิดริเริ่มทางการศึกษาบนโลกดิจิทัล โดยภาพรวมทั้ง 6 ด้าน อยู่ในระดับสูง 2) แนวทางการพัฒนาความคิดริเริ่มทางการศึกษาบนโลกดิจิทัล ประกอบด้วย 37 มาตรการ ได้แก่ การส่งเสริมความคิดริเริ่ม การปรับปรุงทรัพยากร การบูรณาการเทคโนโลยี การให้คำแนะนำอย่างเป็นระบบ ความรู้ด้านดิจิทัล การสนับสนุนทางการเงิน และการจัดการนโยบาย ผลการประเมินความเหมาะสมและความเป็นไปได้ของแนวทาง อยู่ในระดับสูง โดยผลการประเมินแสดงให้เห็นว่า มีการสนับสนุนสำหรับการพัฒนาความคิดริเริ่มทางการศึกษาบนโลกดิจิทัลในวิทยาลัยอาชีวศึกษาในมณฑลยูนนาน

คำสำคัญ: ความคิดริเริ่มทางการศึกษาบนโลกดิจิทัล วิทยาลัยอาชีวศึกษา แนวทางการพัฒนา

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Chapter 1

Introduction

Rationale

The prominence of data value and the improvement of data acquisition means and data processing technology are the root causes of the explosion of big data. With the factorization of data production, the continuous development of data science, data technology and the deep excavation and application of data value, a big data revolution is underway. It will drive innovation and change in various fields such as national strategy and regional economic development, smart city construction, enterprise transformation and upgrading, campus management and personal work and life. In response to the historical opportunity of the continuous innovation and development of the global Internet and information technology, the promotion of digital education initiatives is both a strategic initiative for the development of education in all countries. It is also a significant challenge for education in all countries (Li Jinlin, 2018). Improving digital education initiatives is imperative for the advancement of education. Contemporary society increasingly demands skills, with rapid technological advancements necessitating the evolution of traditional educational models to meet market and industry needs.

Digital education is conducive to promoting the balanced development of education, achieving educational equity, improving national quality, cultivating innovative talents and promoting the development of the education information industry. It is not only an important connotation and component of education mainstreaming, but also an important way to realize education demonstration (Su Xiaoling, 2021). The development of digital technologies has driven the education model to successfully break through the space-time limit and to promote a double revolution in education and learning. Digital education can provide broader educational resources and opportunities. Particularly for vocational colleges in remote or resource-constrained regions like Yunnan, it could dismantle constraints of

traditional education models, enabling more students to access high-quality educational content.

Under the impact of the new crown pneumonia epidemic, the global education system has been greatly impacted. Digital education is also facing new opportunities and challenges. Therefore, digital education has become an irreversible trend of the times. Digital technologies are changing with each passing day, information resources are vast, and it is imminent to improve the digital literacy of whole people. How to really apply big data and give full play to the power of big data is a common research and exploration problem for all people at present. For example, the European Union formulated and promulgated the Digital Education Action Plan (2021-2027), which proposed two strategies, which are developing a high-performance digital education ecosystem and improving digital skills and capabilities for digital transformation. This program supports the sustainable and effective adaptation of education and training systems in member countries to the development and changes in digital education (Wang and He, 2022, p.27). The European Union's digital education reform provides four inspirations for digital education initiatives in Yunnan, namely strengthening digital skills training, improving infrastructure support, promoting information literacy education into the curriculum system, and creating a cooperation and exchange platform for educational information resources and experience sharing. Various countries and regions are promoting the development of digital education through educational policies. Yunnan's vocational colleges should actively respond to these policies to uphold the advancement and competitiveness of education.

In the new era of education informational, digital education initiatives in vocational colleges in Yunnan face a rare historical opportunity for development. The importance of promoting digital education initiatives is clearly stated in the Yunnan Provincial Three-Year Action Plan for High-Quality Development of Education (2023-2025) issued by the Yunnan Provincial Department of Education. Specifically, it addresses the problem of insufficient capacity for the development of digital transformation in education, and comprehensively improves the level of digitalization in education by building the Yunnan education public service platform, accelerating the development and application of digital educational resources, and building digital

campuses. For that purpose, this study analyzes and researches the digital education initiatives of Yunnan vocational institutes based on the concept of education administration and the characteristics of the construction, management, distribution and application of educational resources. It will contribute to the analysis and understanding of the overall situation of digital education initiatives in vocational colleges in Yunnan, as well as the discovery of problems, trends and patterns using big data technology. In addition, a reference for leadership decision-making will be provided by this study. It will provide guideline to further improve the quality management and construction level of vocational college system.

Research Questions

　　1. What is the current situation of digital education initiatives in vocational colleges in Yunnan?

　　2. What are the guidelines for improving digital education initiatives in vocational colleges in Yunnan?

　　3. Are the guidelines for improving digital education initiatives in vocational colleges in Yunnan adaptability and feasibility?

Objectives

　　1. To study the current situation of digital education initiatives in vocational colleges in Yunnan.

　　2. To provide the guidelines for improving digital education initiatives in vocational colleges in Yunnan.

　　3. To evaluate the adaptability and feasibility of the guidelines improving digital education initiatives in vocational colleges in Yunnan.

Scope of the Research

Population

The population of this research was 358 administrators from 8 vocational colleges in Yunnan. According to the summary table of the province's administrative division statistics released by the Yunnan Provincial Department of Civil Affairs, as of 2022, Yunnan province governs eight prefecture-level cities. The eight vocational colleges are composed via one vocational college in each prefecture-level city.

The interviewees in this research were 13 senior executives with rich experience in education administration. The qualifications of interviewees are as follows: 1) at least 5 years of work experience in high-level administrator in colleges, 2) at least 3 years of work experience in digital education, 3) graduated with master's degree or above.

The Variable

According to the analyzed of related theories and researches, digital education initiatives are as follows:

1. Digital educational resources
2. Digital technologies
3. Digital transformation of education
4. Digital literacy
5. Financial inputs
6. Effectiveness of education policy implementation

Advantages

1. Almost all learning and employment in the future demands that people have digital competencies and skills. Particularly since the outbreak of the COVID-19 pandemic, the importance of having digital competencies and skills and ensuring the availability of digital infrastructure and devices has become very evident. Equal access to education and opportunities for everyone to gain employment and become part of society can be achieved via digital education initiatives.

2. Digital education is essential for citizens. As continuous technological change requires all people to maintain lifelong learning skills in order to maintain their core competencies and participate in the life of society. In the process of digital transformation of education and society, digital education initiatives are a crucial link for educational equity and universal participation in education.

3. There is a shortage of research on digital education initiatives in Yunnan by experts and scholars. This study has positive significance for promoting digital education initiatives in vocational colleges in Yunnan. It is believed that the results of the research will encourage the society to attach more importance to digital education initiatives in vocational colleges. The results of the study will also provide a guideline for the education administration and vocational colleges in Yunnan to advance digital education initiatives.

Definition of Terms

1. Digital education refers to the education utilizing modern digital technology. The concept was first introduced in the 1990s, when technology developed rapidly and the development of computer technology enabled digital education.

2. Digital education initiatives refers to in-depth promotion of digital awareness, digital thinking and digital application in education field, elements, processes and businesses, and the construction of a new ecosystem of digital education. The initiatives aim to foster innovation and access to education while promoting inclusiveness and accessibility to meet the needs and backgrounds of diverse learners. The digital education initiatives also address policies and plans developed by educational institutions and government departments to support and promote the development and application of digital education.

3. Digitization of education refers to the complex of socio-educational transformations in which technology is deeply integrated into the education system. In a narrower sense, it refers to the introduction of technologies into educational organizations, as well as the innovation and transformation of products, processes or models based on these technologies.

4. Digital Educational Resources (DERs) is a broad concept that refers to a wide range of tools, methods and materials. Digital educational resources are digitized resources generated on the basis of information technology. There is a high degree of integration and sharing of educational resources in digital education, and then digital educational resources could meet the needs of the digital education initiative. Optimal allocation of digital educational resources is a core issue that needs to be addressed in the theoretical and practical research on education.

5. Digital technologies enable the construction of a more direct and efficient network that breaks down the flat connections of the past. In addition, the use of digital technology is now very common and is highly valued in the education system. Colleges with higher digital technology usually have higher levels of network resource sharing, higher levels of intelligence, and higher levels of smart technology applications.

6. Digital transformation of education refers to the introduction of technology into educational organizations, as well as the innovation and change of plans, systems, processes or models based on these technologies. For colleges, administrators have developed a vision of goals, areas of practice, technology adoption routes and strategies in order to clarify the digital transformation of education. Then, a perfect digitization guarantee system is achieved through a reasonable digitization leading organization and rigorous digitization planning (policy planning, financial investment, professional training, etc.).

7. Digital literacy refers to the comprehensive scientific skills and cultural literacy of being able to quickly and effectively discover and acquire information, evaluate information, integrate information and communicate information by utilizing certain information technology means and methods in a digital environment. The essence of digital literacy is competence.

8. Financial inputs refer to an assessment of the extent to which college administrators are investing funds in digital education initiatives. Colleges require a dedicated source of funding to support digital education programs. These funds are available to cover all aspects of the digital education program, including the acquisition of digital education equipment, platform construction, faculty training, and so on. In

addition, having a clear budget planning and management mechanism is another important part of the implementation process.

9. Effectiveness of education policy implementation is a measure of the degree of policy support for digital education initiatives by college administrators, including policy development, policy advocacy, and policy implementation. The concept of educational policy leadership emphasizes the critical role of leaders in policy development, advocacy, and implementation. It demonstrates the importance of leaders' policy support for the successful implementation of improved digital education programs.

10. Guidelines for Improving are principles or recommendations aimed at providing direction and methods for enhancing processes, systems, or organizations. These guidelines typically derive from research, best practices, or professional expertise, intending to identify issues, set objectives, and offer practical advice to improve efficiency, quality, or outcomes. They serve as a framework for organizations to effectively address challenges, optimize operations, and continuously elevate their performance and achievements.

11. Vocational colleges in Yunnan are educational institutions in Yunnan Province, China, that specialize in providing practical skills and training related to specific trades, professions or industries. These institutions primarily prepare students for direct entry into the labor market or for further education in a vocational field. The aim is to equip graduates with the necessary skills to meet the needs of regional industries.

Research Framework

Digital Education Initiatives in Vocational Colleges in Yunnan
1. Digital educational resources
2. Digital technologies
3. Digital transformation of education
4. Digital literacy
5. Financial inputs
6. Effectiveness of education policy implementation

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Guideline for Improving Digital Education Initiatives in Vocational Colleges in Yunnan
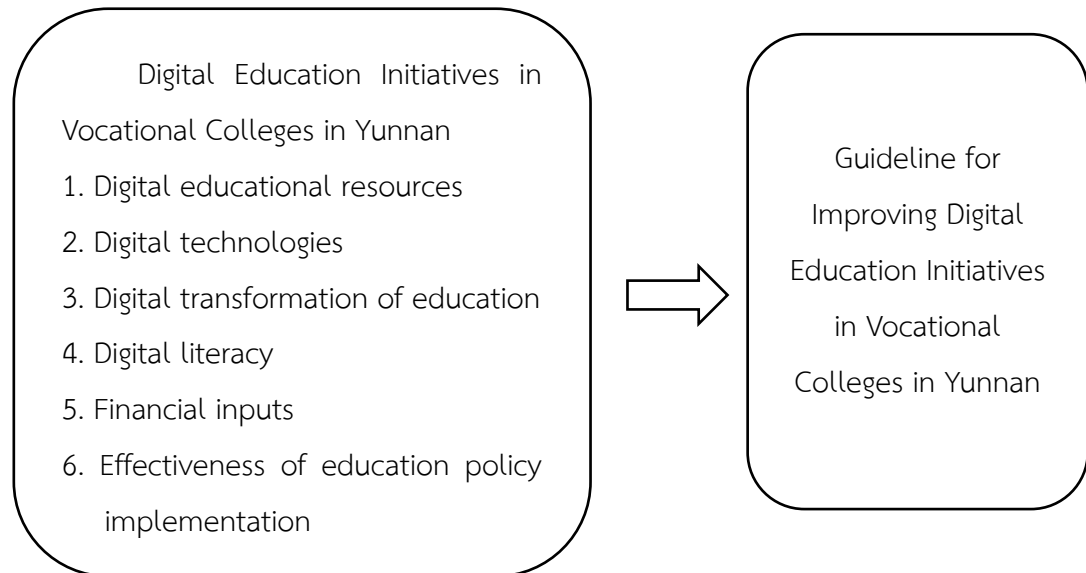
Figure 1.1 Research Framework

Chapter 2

Literature Review

The research in digital education initiatives in vocational colleges in Yunnan the researcher was analyzed documents, concepts, theories, and researches related to digital education initiatives. The details are as follows.

1. Concept of educational administration
2. Concept of digital education initiatives
3. Concept of digital education
4. Concept of digital educational resources
5. Concept of digital technologies
6. Concept of digital transformation of education
7. Concept of digital literacy
8. Concept of financial inputs
9. Concept of effectiveness of education policy implementation
10. Related research

The details are as follows.

Concept of Educational Administration

Based on the articles provided, advancements in technology such as big data and artificial intelligence are reshaping educational administration. These innovations promise more efficient decision-making, improved resource allocation, and personalized learning experiences, reflecting a shift towards data-driven management and adaptive leadership in educational settings.

Shen and Xia (2018, p.17) believed that the wide application of big data technology provides new ideas and means for education administration, which can help education managers make decisions and plans more scientifically and improve the efficiency and level of education management. Educational management mechanisms and management modes need to be innovated and improved, such as establishing an informational management platform, strengthening the ability of data

analysis, and optimizing the allocation of resources, in order to cope with the challenges and problems faced by educational management. With the continuous development of big data technology and the expansion of application scenarios, education management will usher in more in-depth changes and innovations, providing new opportunities and challenges for the reform of the education system and the improvement of education quality.

Li (2019, p.84) believed that the behaviors and decisions of educational leaders are influenced by the social and cultural environments in which they are embedded, Bourdieu's theory of "logic of practice" provides a new perspective for understanding educational leadership behaviors. Bourdieu's theory of "practice logic" can help to understand the decision-making process and behavioral logic of educational leaders, thus promoting the generation and transmission of wisdom. Bourdieu's "logic of practice" theory can help to understand the decision-making process and behavioral logic of educational leaders, thus facilitating the generation and transmission of wisdom. The author puts forward some specific suggestions and measures, including strengthening the training and development of educational leaders, optimizing the organizational management mechanism, and strengthening teamwork and collaboration, in order to enhance the wisdom and leadership ability of educational leaders.

Patel and Nguyen (2020, p.89) proposed that principals, as educational leaders, play a key leadership role in promoting school development, improving the quality of education, and achieving school goals. As the educational environment and societal needs change, principals' leadership styles and strategies need to adapt and change to meet new educational challenges and opportunities. Principals can adopt practical experiences and lessons learned in the process of school improvement in formulating school development plans, establishing effective teamwork mechanisms, promoting teachers' professional development and strengthening home-school cooperation.

Liu and Zhang (2021, p.1735-1750) pointed out the important role of technology in educational administration. The application of technology can improve the efficiency and quality of educational management, provide more data and

information support for educational administrators, and promote the development and improvement of educational institutions. There are many challenges facing technology in educational management. It is because the rapid development and application of technology may bring a series of challenges, such as data security, privacy protection, and information management, which need to be seriously addressed and solved by educational administrators. The application of technology may change the ways and modes of education management and promote the development of informationization, intelligence and data-driven management methods, thus enhancing the level and effectiveness of education management.

Zhu and Hu (2021, p.45) believed that in the future, education management will pay more attention to the use of artificial intelligence, big data and other technical means to achieve intelligent allocation of educational resources and personalized customization of the teaching process.

Wang and Zhang (2021, p.20) emphasized the importance of leadership style and organizational culture in educational administration. The impact of different leadership styles on organizational culture in educational institutions. Different leadership styles may have different impacts that shape organizational values, behavioral norms, and work climate. Leaders' behaviors and decisions may have a significant impact on the organizational culture, thus affecting the overall functioning and direction of the educational institution.

Zhu and Hu (2022, p.5) pointed out that with the continuous progress of technology and the expansion of application scenarios, education digital transformation will have a profound impact in the field of education administration. The digital transformation of education is not just simply moving traditional educational content to a digital platform, but more importantly, combining the advantages of digital technology, rethinking the goals, ways and methods of education, and realizing the innovation and enhancement of the education model. Future studies will pay more attention to the actual effects and application cases of education digital transformation, explore more effective management strategies and technology applications, and promote the continuous improvement of education administration.

Garcia and Martinez (2022, p.387) highlighted the importance of fostering resilience in the field of educational administration. Resilient managers are able to adapt to change and cope with challenges, thus better coping with uncertainty and stress. Methods and strategies for developing resilience in educational administrators include providing support networks, offering training and development opportunities, and creating effective mechanisms for coping with stress.

Zhu and Hu (2022, p.15) proposed that the digital transformation of education is an important issue in the field of education administration, which involves many aspects such as technology, policy, and organization. Through the introduction of advanced digital technology and management mode, it can improve the utilization efficiency of educational resources, optimize the teaching management process, expand the teaching methods and means, and then enhance the quality and effectiveness of education.

Smith and Johnson (2023, p.211-226) emphasized the importance of leadership in educational administration. There are critical roles for leaders in improving leadership in schools, especially through the use of effective management strategies. Educational administration requires a strategic vision to achieve the long term goals of the school through the development and implementation of long term planning. There are challenges in educational administration such as inadequate resources, staff management problems and implementation of management strategies. Effective educational leadership promotes overall school development and improved student performance.

Li (2023, p.24-26) pointed out that with the continuous development and popularization of digital technology, smart education is gradually emerging as a new form of education. Educational administrators need to be aware of this change and actively explore how to deal with the challenges and opportunities brought by smart education. The researcher emphasizes the important role of technology in education management. By introducing intelligent education management systems and tools, schools can improve management efficiency, optimize resource allocation, and promote education quality. Educational administrators need to formulate development plans and policies for smart education, strengthen the construction of

teaching staff, enhance teachers' digital literacy, and promote the innovation of curriculum content and teaching methods to meet the development needs of smart education.

Liu (2024, p.24) considered the reforms and adjustments needed for educational administration in the context of wisdom education. The emergence of smart education, which refers to a new education model that utilizes advanced information technology and data analysis means to enhance the effectiveness of education and teaching and management efficiency, has brought new opportunities and challenges to education administration. This may involve the formulation of smart education development plans, strengthening the construction of digital teaching resources, and promoting the construction of education information technology management platforms.

In conclusion, educational administration refers to the process and practice of managing and leading educational institutions. This area covers the formulation of educational policies, planning of curricula, recruitment and admissions, financial management, staff development, management of student affairs, and assessment of the quality of education. Educational administrators are responsible for ensuring the effective operation and development of a school or educational institution to enhance the quality of education and student outcomes. Leadership, knowledge of educational theory, organizational and management skills, and a deep understanding of educational policies and regulations are required for management and decision-making. Educational administration is concerned not only with academic achievement, but also with the holistic development of students and educational equity, and is committed to providing a safe, supportive and stimulating learning environment for students.

Concept of Digital Education Initiatives

Digital education initiatives encompass the advancement of digital awareness, thinking, and applications across educational domains, fostering innovation and inclusivity. These efforts aim to build a new digital education ecosystem, supported by policies from educational institutions and governments, evolving from infrastructure development to deep integration and innovation in educational practices.

Yu (2005, p.55) proposed to divide the educational and pedagogical applications in advancing the implementation of digital education initiatives into three stages. The first stage is simple presentation-based courseware or large and comprehensive lecture-based courseware. The second stage is the use of digital technology as learning tools, cognitive tools, emotional motivation tools, evaluation tools, research tools, etc. to promote the realization of immersive learning in the classroom and the formation of learning and teaching structure. The third stage is the full integration of digital technology with education and teaching.

Buchanan (2011, p.67) proposed that digital education initiatives culminated in the Australian federal government's digital education revolution. This initiative introduces computers into schools and implements technological pedagogical practices, representing a multi-billion dollar commitment. Drawing on Giroux's (2004) concept of public pedagogy, this study finds that digital education initiatives are a product of the impact of globalization on education, but that it still contains contradictory injunctions and possibilities.

Huang (2011, p.5) suggested that the development of digital education initiatives in China is divided into four stages: computer subject teaching, computer-aided teaching and management, infrastructure-centered education information construction, and application-centered education information construction.

Qu et al. (2015, p.2074-2078) proposed that digital education initiatives could be divided into four stages when viewed in conjunction with the contribution of the five major elements of the digital education system (digital infrastructure construction, digital resource construction, digital security construction, digital application, and digital subject development) to the enhancement of the system at different stages. Those are the starting stage mainly characterized by information technology infrastructure

construction and information technology resource construction, the application stage mainly characterized by information technology application, the integration stage mainly characterized by two-way integration of education and information technology, and the change stage mainly characterized by information technology main body development.

He Kexiang (2016, p.2) proposed to microscopically divide the development of digital education initiatives into three phases: infrastructure development, emphasis on pedagogical applications, and reflective exploration.

Conrads et al. (2017) suggested that digital education initiatives offer approaches on how to design and implement policies at the national or regional level to promote learning in the digital age.

Zhao (2018, p.6-9) pointed out that digital education initiatives can be approached in three ways. Firstly, increasing the awareness of schools of the benefits and grants available, and realizing strategies focused on supporting disadvantaged areas. The second is to enhance the digital competence of teachers, trainers and learners through the use of self-assessment tools (SELFIE). This facilitates digitization in general schools and vocational colleges. The third is the development of a framework for awarding digital skills qualifications that is verifiable, multilingual and stored in the cloud.

Li Haolong (2020) stated that digital education is an endogenous force for systemic changes in education, promoting the renewal of education concepts, modal changes and systemic restructuring. The modernization of education is facilitated by the support of digital technology, so as to gradually realize the revolutionary impact of information technology on the development of education. This is an essential objective of the current digital education initiatives.

Dong Lili (2021, p.16) proposed that the digital transformation of education systems has now entered an accelerated phase. On the one hand, the education system itself has to optimize the use of digital technologies to enhance the equity of education and improve the efficiency of teaching and learning. On the other hand, the education system has the responsibility to provide strong support for the development

of citizens' digital competence. Against this background, digital education initiatives have been widely launched in countries around the world.

Li Gao (2022, p.72) highlighted that With the concept of digital society, the major countries and international organizations in the world have proposed to promote digital education initiatives, which will adapt to the future labor market and lead the future development. From the development of digital education initiatives in various countries, there are three stages of digital education. The first stage is information digitization, refers to the initial data of information content in the college. It is the stage where a physical form is transformed into a digital form. The second stage is the digitization of the process refers to the digitization of teaching and administration services in schools. Moreover, it is the utilization of digital technology to automate the operation process of the school, which makes the management process more fluent and concise. The third stage is digital education transformation, which brings about a comprehensive transformation of the way educational colleges operate and their strategic orientation.

In conclusion, digital education initiatives refers to in-depth promotion of digital awareness, digital thinking and digital application in education field, elements, processes and businesses, and the construction of a new ecosystem of digital education. The initiatives aim to foster innovation and access to education while promoting inclusiveness and accessibility to meet the needs and backgrounds of diverse learners. The digital education initiatives also address policies and plans developed by educational institutions and government departments to support and promote the development and application of digital education. There are certain differences in the division of the development stage of the current digital education initiatives, however, from the focus of the current digital education construction concerns, the majority of scholars agree that digital education initiatives have evolved from focusing on the infrastructure and resource construction, information technology popularization and deepening of the application stage to the stage of in-depth application and integration and innovation.

Table 2.1 The results of the synthesis of digital education initiatives

Characteristics of digital education initiatives / Author	Yu Shengquan (2005)	Xin Xishen (2019)	Buchanan (2011)	Huang Ronghuai (2011)	Zhao Sen (2018)	Jiang Yumei (2020)	Li Haolong (2020)	Dong Lili (2021)	Tsarapkina et al. (2021)	Zhang et al. (2021)	Li Gao (2022)	Total
digital literacy			√	√	√	√	√	√	√	√	√	9
digital educational resources	√	√		√		√		√	√		√	7
digital technologies	√		√	√	√	√	√	√	√	√	√	10
digital education system construction					√	√		√	√		√	5
transformation of digital education			√		√	√	√	√	√	√	√	8
financial inputs	√		√	√	√	√	√	√	√	√	√	10
effectiveness of education policy implementation			√	√	√	√	√	√	√	√	√	9

According to table 2.1, the researchers analyzed and synthesized documents, concepts, theories, and researches related to digital education initiatives, which consisted of Yu Shengquan (2005); Xin Xishen (2019); Buchanan (2011); Huang Ronghuai (2011); Zhao Sen (2018); Jiang Yumei (2020); Li Haolong (2020); Dong Lili (2021); Tsarapkina et al. (2021); Zhang et al. (2021); Li Gao (2022). The researcher used the criteria to consider the corresponding characteristics, and use the result as a framework for research in this study. From the five characteristics of digital education initiatives (digital literacy, digital educational resources, digital technologies, digital education system construction, transformation of digital education, financial inputs, effectiveness of education policy implementation), the characteristics with a frequency of 6 or more were selected for participation in the study.

Importance of digital education initiatives

Chen (2019) putted forward to give full play to the advantages and characteristics of digital technology for digital education initiatives. On the one hand, the advantages and characteristics of information technology could be fully utilized to promote the transformation of the education model to quality education. In turn, the digital education ecosystem is truly constructed. On the other hand, by giving full play to the advantages of digital technology process reengineering, the teaching and management process can really realize traceability and inspection, so as to realize the reversal of unscientific education evaluation orientation and fundamentally solve the problem of education evaluation.

Huang (2020, p.5) proposed that as information technology continues to evolve, the ways of acquiring and imparting knowledge have been revolutionized, and the digital reform in the field of education is accelerating with each passing day. Digital education initiatives refer to in-depth promotion of digital awareness, digital thinking and digital application in all fields, elements, processes and businesses, and the construction of a new ecosystem of digital education. It mainly includes the following six tasks:

Firstly, transforming the concept of education and teaching is the crucial point, and it is necessary to pay attention to the value of the digital transformation of education. The second is to strengthen the construction of digital teaching materials and promote the digital transformation of the teaching process. The third is to emphasize innovative smart assessment technology, thus supporting the digital reform of education evaluation. The fourth is to build a smart teaching environment, which is to strengthen the foundation of digital education in schools. The fifth is to optimize the public service system and promote the development of digital education in regional education. The sixth is to upgrade the education ecology and create an international business card for digital education.

Tsarapkina et al. (2021, p.12-30) pointed out that Digital education initiatives based on digital technologies contribute to the emergence of new forms and methods of teachers' tasks. The search for new learning technologies in digital education helps teachers to improve their motivation in their professional activities.

Lynn et al. (2022, p.133) proposed that digital education initiatives are essential for the development of digital technologies in education. It is an essential part of informing and monitoring the development of policies and actions.

Li Gao (2022, p.72) suggested that the construction of a digital society has become an international consensus, and the promotion of digital education initiatives is currently an important education strategy of international organizations and countries. To explore digital education initiatives actively, countries have conducted research on the formulation of macro strategies, infrastructure construction, development and application of digital education resources, enhancement of digital capacity, and construction of digital governance systems, etc. However, digital education is facing real challenges, such as huge construction costs, technological problems, educational equity problems, lack of educational readiness, and differences in technological beliefs. China requires further efforts to deepen its digital education governance system. For example, it should promote the development of high-level free digital consultation sources, enhance the digital competence of teachers, students and administrators, and strengthen international cooperation in the digital transformation of education.

Wang and Wu (2022, pp. 24-34) pointed out that the implementation of digital education initiatives is an opportunity for educators to improve their digital skills. If educators are able to utilize digital technologies proficiently, equitably and effectively, digital technologies support a comprehensive agenda of high-quality, inclusive education and training for all learners. Digital technologies assist learners, educators to access, create and share digital content. It also allows learning to take place anywhere outside the lecture hall, classroom or workplace, without the constraints of space and time.

Weng Weibin (2023, p.102-109) believed that promoting digital education initiatives can be achieved by reconstructing the education ecology through digital thinking. This is not only the effective use of digital technology to empower the modernization of education but also to enhance the adaptability of education with digital development as an opportunity. At the same time, the development of digital technology has intensified the dissolution and substitution of instrumental rationality

for value rationality. The development of digital education is faced with the difficulty of reaching specific or individual educational facts, as well as the inability to deal with the reality of timely and dynamic dilemma.

In conclusion, the world has now entered the era of the digital economy, and digital education initiatives are an urgent necessity to adapt to the global digital transformation. The arrival of the digital economy is driving profound changes in the mode of production, lifestyle and governance. Governments are actively promoting digital education initiatives to seize the new opportunities of global digitalization. It is important to have a deep understanding of the profound revolution caused by digitalization to economic and social development and the great transformation of the demand for talents. It is a promising approach to promote the quality of education and instruction via digital education initiatives, and to contribute to the construction of a digital education powerhouse.

Context of digital education initiatives in vocational colleges

Zhang et al. (2021, p.152) proposed that along with the digital, intelligent and networked mode of social production, the organizational mode of work has undergone fundamental changes. The instability and uncertainty of an individually career has increased. Therefore, it is necessary for vocational education to respond to the development and changes of digital technology in a timely manner, so as to effectively serve the career development of learners. Moreover, digital vocational education and training models should be innovated and oriented to specific needs. Based on the career assessment data for career choice and career guidance, for specific job requirements to develop the curriculum content system and practical training system, combined with the type of target groups to configure the digital media support strategy, and then form a systematic and targeted digital vocational education and training system.

Li and Pan (2022, p.76) pointed out that the European Union believes that, in the context of the dual transformation of the greening and digitalization of the European economy, the integration of digital education into the high-quality development of vocational education ensures the sustainable development of individuals and society through the application of digital technologies. Therefore, the

EU actively promotes the integration of digital education into vocational education, comprehensively introduces a series of policies for the digital transformation of vocational education, and actively deploys digital competence strategies, and supports and innovative vocational digital education initiatives.

Li and Ju (2023, p.3) proposed that digital transformation is an important carrier and direction for the future transformation and development of vocational education. The new personalized nurturing space combining virtual and real, the common construction and sharing of all kinds of educational digital resources, and the concept of data governance with full participation provide brand new development opportunities and development modes for the personalized cultivation of students, the socialized service of vocational education, the digital governance of schools, and the construction of a lifelong learning society. Vocational education should take the initiative to adapt to the requirements of digital education initiatives, explore the new rules of vocational education in the context of digital education, promote the deep integration of digital technology and education and teaching, and build a new system of digital development for vocational education.

Li Yaodong (2023, pp. 20-22) presented that China attaches great importance to the development of vocational education, and has successively issued programmatic policy documents such as the National Implementation Plan for Vocational Education Reform and the Action Plan for Improving Quality and Excellence in Vocational Education (2020-2023). It shows that China attaches high importance to the work of vocational education. The aim is to accelerate the construction of a digitized vocational education system and to train more high-quality technical and skilled personnel. Moreover, with the acceleration of the digital transformation of society and enterprises, the demand for talents has put forward higher requirements. For example, students of management majors in higher vocational colleges are not only mastering basic theoretical knowledge of management, but also increasing the knowledge of digital technology and digital management. This requires vocational colleges to increase courses in digital technology and digital skills in talent training and curriculum system settings.

Xu Tongqin (2023, p.75-78) discovered that the student base of Chinese vocational colleges is large enough that the current reality does not allow for absolute individualization. In addition, there are some differences in the vocational education model and school mission in each region, which poses a challenge to absolute individualized education. However, the individualized education emphasized in Germany's "Vocational Education 4.0" strategy is still a valuable reference for digital education initiatives in vocational colleges. The German "Vocational Education 4.0" program is a significant departure from the previous development path in two ways. Firstly, digitization and networking have been applied. Network technologies, sensors/actuators, cloud computing, data collection, etc. are used. Secondly, companies are deeply involved in digitization, but the technical and structural conditions have not yet been fulfilled. Germany's "Vocational Education 4.0" in the construction of the curriculum is mainly carried out in the "M + E" field, Germany's reform emphasizes that the certification of a certain technology is no longer based on the requirements of a specific profession or course. This includes, of course, the corporate training schools associated with vocational colleges.

Li Chuanwei (2023, p.59) believed that vocational education, as a type of education, is getting more and more attention from the society. In the period of digital transformation, vocational education needs to change accordingly with the times.

In conclusion, digital transformation is a necessary path for the development of vocational education, and it is an important opportunity for vocational colleges to realize the development of digital education. The wide application and comprehensive promotion of digital technology in vocational education is of great significance for enhancing the ability of vocational colleges to operate education, promoting the high-quality development of vocational education, improving the level of cultivation of technical and skilled talents, and promoting the digital upgrading of industry and economic and social development. Digital education initiatives are not only the requirements of the digital era but also the urgent need for the development of the cause of vocational education itself. Digital education initiatives are not only the requirements of the digital era, but also the urgent need for the development of vocational education. Vocational colleges should actively explore the application and

promotion of digital technology, continuously improve the digital level and quality of vocational education, seize the new opportunities of digital development, reshape the new ecology of vocational education development in an all-round way, and make greater contributions to the cultivation of high-quality skilled talents.

Pathways to practice in digital education initiatives

Li Gao (2022, p.71) proposed that the practical experience of digital education initiatives in foreign countries mainly focuses on five aspects, namely, strategic leadership at the national level, infrastructure construction of digital education, development and application of digital education resources, enhancement of digital education capacity, and construction of digital education governance system.

1. Strategic leadership at the national level

Digitization of education is an important path to building a digital society. It is regarded as an educational strategy to enhance the competitiveness of future talents and comprehensive national power. Therefore, all countries have elevated digital education initiatives to the national strategic level. For example, the U.S. White House Office of Science and Technology Policy have taken digital education technology as one of the U.S. national innovation strategies. It has also continued to issue updates to the National Education Technology Plan, thereby promoting the implementation of the digital campus strategy.

In addition, Japan has formulated the U-Japan digital policy, the Education Informatization Acceleration Plan, and the One Person One Guide for the Learning Environment of the New Era to advance the digital education system to cover primary and secondary schools nationwide. All of this demonstrates the great importance that the Japanese government attaches to the promotion of digital education initiatives. Furthermore, the European Union continues to release its Digital Education Action Plan to develop a European digital education content framework and exchange platform to promote the development of a high-capacity digital education ecosystem.

2. Infrastructure construction of digital education

The prerequisite for digital education initiatives is the construction of digital infrastructure and sustainable operation in a high-quality manner. In this regard, the major countries of the world are developing high-speed networks, expanding their

coverage and connectivity, and constantly researching the effective use of new technologies in the education sector. They are also constantly researching the effective use of new technologies in education.

For example, the United Kingdom Government plans to have a nationwide high-speed fiber-optic network that is stable, accessible and affordable by 2033. The United States has been focusing on strengthening Internet connectivity and increasing Internet speeds as key elements of its digitalization strategy for remote areas and disadvantaged populations. Japan has also been emphasizing the importance of high-speed and high-capacity networks and the availability of computers. Meanwhile, digital infrastructure development should be carried out with a view to providing appropriate digital services. For example, the selection of appropriate digital devices depends to a large extent on the age of the students, individual learning demands, the curriculum and the way in which the curriculum is delivered, etc.

3. Development and application of digital educational resources

Digital resources for education mainly refer to curriculum materials, digital libraries, digital cultural libraries, resource sharing platforms and so on. Especially during the outbreak of the COVID-19 pandemic, the open sharing and interconnection of digital educational resources has become an important initiative to solve the education crisis.

The digital educational resources in the UK are developed by enterprises. After being validated by the Quality Assurance System (QAS), they are published by the Department for Education to the National Curriculum Online website, where individuals and colleges are able to purchase digital educational resources. Moreover, during the outbreak of the COVID-19 pandemic, the Japan Education News Network compiled a list of home study materials containing more than 90 courses. These digital educational resources are jointly produced and maintained by companies and social organizations, and are open to the public free of charge for a limited period of time. In terms of value orientation, UNESCO has embraced the principles of inclusion and equity in its digital education initiatives.

4. Enhancing digital capacity in education

Digital competence is an important guarantee for the realization of digital education, and it also affects the process and quality of digital education initiatives. Digital competence is aimed at teachers, students, administrators and the workforce, with teachers being the most important. The European Union has developed a specific guidebook to improve the digital literacy of teaching staff. It has also updated its Digital Competency Framework and created a European Certificate in Digital Skills to encourage participation in the International Study of Computer and Information Literacy (ISCIL). Additionally, the new Digital Literacy Enhancement Program in the United States focuses on the ability of teachers to locate, assess, and communicate quality information online. It also attracts and motivates students and young professionals to address issues related to digital literacy and improve their overall competitiveness. To promote the digital competence of incumbent workers in Australia, enterprises as well as the community are providing digital lifelong learning resources to the public.

5. Digital education governance system construction

First of all, the construction of digital education governance system requires attention to the construction of organizations and colleges to promote digital education initiatives. Various countries have formed a four-way synergistic mechanism of government-academic-market and university, playing a synergistic role of government leadership, academic research, market development, and university promotion. For example, the Digital World Strategic Vision of the United States of America brings together five key action areas, namely digital education, digital infrastructure, legal framework, development of educational colleges, and integration of digitization and internationalization, to comprehensively promote digital education initiatives in the U.S. In Australia, to contribute to digital education initiatives, the State of New South Wales has established the Centre for Education Statistics and Evaluation, which provides data analysis, information and evaluation to improve effectiveness, efficiency and accountability. In terms of building a governance system for digital education beyond national borders, there is a demand for greater leadership in digital construction. For instance, the Global Institute for Emerging Leadership in Online

Learning aims to establish a global community of practice to increase access to quality education and advance digital learning transformation globally.

In conclusion, digital technology has always played an important role in the continued advancement of pathways to practice in digital education initiatives, and also determines the necessity and urgency of strategic research, especially at the national level. The three strategies of integration and innovation, optimization of services, and technological leadership are both independent and interrelated. The strategy of integration and innovation focuses on the path, way and means. The optimization of services strategy focuses on the creation of a new supply side of education. The strategy of scientific and technological leadership focuses on how to provide theoretical and technological support, leadership, and drive for digital education to support, lead, and drive education. Integration and innovation requires the orientation of excellent service to the whole school, and optimization of service supports the leading of science and technology.

Concept of Digital Education

Digital education encompasses both narrow and broad interpretations. Narrowly, it leverages advanced information technologies like mobile internet, cloud services, and big data to enhance learning through digital tools and formats. Broadly, it reflects a shift driven by the digital economy, transforming education concepts, promoting resource equity, and fostering high-quality education development.

Dillenbourg (2016, p.544) proposed that digital education is composed of the physicality of interaction and the physical space of the learner.

Li Jinlin (2018) proposed that digital education is conducive to promoting the balanced development of education, realizing educational equity, improving national quality, cultivating innovative talents and promoting the development of education informatization industry.

Zhao (2018, p.6-9) highlighted that the key to digital education is to ensure the quality of infrastructure and equity of access. Improving the connectivity of educational technologies is a starting point for reducing inequalities and allowing students and educators to benefit from digital technologies.

Ren Youqun (2019, p.6) noted that the connotation of a higher level talent cultivation system is far-reaching. The construction of its various components requires the participation of a new generation of digital technology and the support of a higher level of digital education. In this sense, digital education is no longer a category in the field of education. On the contrary it has become an essential part of the development of education in the new era in all dimensions and at all levels.

Kyaw et al. (2019) suggested that digital education is as effective as traditional learning. Blended digital education may even be more effective in terms of communication skills and knowledge. In addition, the number of interactive formats had little effect on digital education in terms of post-intervention skills.

Xin Xishen (2019, p.13) proposed that the Chinese Ministry of Education issued the Education Information Technology 2.0 Action Plan in April 2018. The plan proposes to basically realize the development goal of three full, two high and one big by 2022. The 2.0 action plan opens a new era of digital education and a new journey of digital education. The new era has given a new mission to digital education, and started a new journey of leading education digitalization to modernize education and build a strong education country.

Chen Lin (2020, p.634) suggested that digital education is closely linked to digital technologies that are evolving at a high rate, permeable and disruptive.

Dong Lili (2021, p.16) highlighted that digital education covers two distinct but interrelated aspects. It is the use of digital technologies for teaching and learning and the development of digital competencies for learners. It means that not only should technology be used to improve and extend education and training, but also to equip all learners with the digital competencies that will enable them to live, work, learn and develop better in the digital era.

Maity et al. (2021, p.405) proposed that the Covid-19 pandemic has fueled the implementation of digital education, transforming from Blackboard to Google Meet, Zoom and WebEx, among others. The research analyzed the raw data of 750 respondents from West Bengal, India by applying Friedman's test, Wilcoxon signed rank test and effect size. The study shows that digital education has a significant impact on students from primary and secondary schools to universities.

Lynn et al. (2022, p.133) proposed that digital education refers to the access to digital technologies and the infrastructure needed to support them in formal and non-formal education within a community. Thus, digital education in this conceptualization is primarily aimed at the community rather than the individual.

Li Gao (2022, p.71) pointed out that the application of digitalization in education scenarios is mainly reflected in classroom teaching, teaching evaluation, school management, research services and education training.

In conclusion, the concept of digital education could be understood in both narrow and broad sense. Digital education in the narrow sense refers to the education that is supplemented by various cutting-edge applications of information technology. The education is made more digital and intelligent through mobile internet, cloud services, and big data. The education can be incorporated into the daily life of students in new forms (recorded classes, live classes, books with electronic materials, boot camps, etc.) to efficiently utilize the fragmented time. Digital education is the stage of the education industry to develop towards paperless and informationization, so that information technology is integrated into the education industry, which is the new trend of education in the future. Digital education in the broadest sense is the inevitable result of the digital economy that the world has now entered. Digital education has deepened the changes in the concept of education, promoted the equitable allocation of educational resources, and promoted the high-quality development of education.

Digital education abroad

1. The US digital education initiatives

Aljebreen et al. (2015, p.25-40) pointed out that in the process of digital education initiatives, the US government has developed a series of related plans and policies. In 2011, the US published a white paper entitled creating a cloud for higher education, which launched the department of data center consolidation plan and the North Carolina Education Cloud, planning to comprehensively promote the application of cloud computing in digital education from technical research, platform promotion and facility construction. In the same year, a study released by the U.S. Department of Education's Office of Educational Technology showed that the majority of districts have

formulated digital education development plans, and mobile learning technology is becoming a priority area of development for all districts.

Anton et al. (2012) proposed that the US has also seen numerous successes in the use of digital education products. In one school in the Selland area of southeast Michigan, all 5,500 students have started using a full suite of Google Apps software, which replaces their email devices and allows them to share spreadsheets, videos and other content, as well as annotate and edit content using Google Docs, greatly helping students to understand and apply their knowledge.

2. European digital education initiatives

Kibe et al. (2012) proposed that as early as 2006, Germany was the first country to establish an Advisory Council for Innovation and Growth and to develop a high-tech strategy with the aim of promoting high-tech research and applications to boost job growth and thus achieve sustainable economic and social development.

Gandia (2020) proposed that in 2010, the German Federal Government published the Information and Communication Technology 2020 Innovation and Research Plan, prepared by the German Federal Ministry of Economics and Technology, which established electronics, micro-systems, software systems, communication technology and networks as key areas for the development of information technology in Germany over the next 10 years, emphasizing the promotion of cloud-based computing technology and the construction of a nationally connected and intelligent network. In the same year, the German federal government published the Information and Communication Technology Strategy 2015 for a Digital Germany, prepared by the German Federal Ministry of Economics and Technology, which sets out the development priorities, main tasks and relevant research projects for 2015 in order to achieve the goal of 'Digital Germany'.

Arpaci et al. (2015, p.93-98) highlighted that the French government also attaches great importance to the development of cloud computing, but it has not developed a specific cloud computing strategy, but rather has promoted the development of cloud computing through project funding and increased support for technology companies. In 2011, France launched the Higher Education Cloud Information Project to support the development of digital education in higher

education. The UK invested over £12.5 million in 2011 to provide cloud computing services for education and research in UK universities and in November launched C-Claud, which aims to create a pool of cloud-based resources by integrating information resources from central government, local authorities, public organizations and commercial organizations. Europe needs to launch a cloud computing strategy. This strategy encourages government departments in member states to take the lead in using cloud computing by coordinating the development of cloud computing plans in each member state. The promotion of cloud services in the public services sector will drive the development of the cloud computing industry.

3. Digital education initiatives in Asia

Wu et al. (2014, p.86-94) proposed that in 2010, Japan's Ministry of Internal Affairs and Communications launched the Future School Promotion Project and commissioned Uchida Yokocho to conduct experiments in western Japan, which led to the establishment of the Uchida education cloud service to actively promote the development of ICT in digital education initiatives. Subsequently, NEC collaborated with 55 campuses of 51 national higher education collegesnationwide, including Nagaoka University of Science and Technology, to build a library cloud platform system, which uses cloud services to enable teachers and students to share the collections and electronic materials of each school. Moreover, Korea's digital education initiatives started in 1996 and has gone through five stages of development: the establishment of a national education backbone network, the construction of campus networks and hardware facilities, the construction of an E-Learning support environment, the construction of a U-leaming support environment, and the construction of a SMART education support environment. This series of measures has promoted the popularization and application of the education cloud in information-based education. In 2011, Korea proposed the Smart Education Promotion strategy, investing more than US$2 billion to achieve this plan and further clarifying the role of the education cloud in supporting the application of digital education. By 2015, Korea plans to fully implement the digital transformation of textbooks and web-assisted teaching for primary and secondary school students by setting up a cloud computing network system. Furthermore, Singapore built a next-generation education cloud

computing data center, which uses powerful data analysis capabilities to help the education cloud identify the educational development needs of different regions through the aggregation of quality educational resources, thereby enhancing Singapore's digital education standards. The Indian government plans to build a national cloud computing platform in 2012 and is ready to channel educational resources through the platform to enhance basic digital education in general.

In conclusion, foreign researchers have basically formed a complete ecological chain in terms of the basic framework design, product development, operation and evaluation of digital education (Qin, 2016, p. 265; Sun, 2022). Although the development of China's digital education initiatives is almost synchronized with that of the developed countries, there is still a long way to go to achieve a high level of construction and application.

Concept of Digital Educational Resources

Digital educational resources integrate technology and education, offering diverse learning options like digital textbooks, online courses, and interactive simulations. They enhance education through vivid, interactive teaching methods, facilitating active learning and improving educational quality and efficiency across various modalities.

Hansen (2017, p.122) believed that the realization of the potential of digital resources requires finding what is associated with a particular digital resource and adapting it to specific district and school characteristics.

Xu (2017, p.98) proposed that the construction of digital resources is the foundation of digital sustainable development, as well as the focus and core content of digital education initiatives. At present, the number of digital education resources is countless, how to solve the problems of intellectual property rights, credit certification, improve quality assurance and overcome the language barrier has become the key to the sustainable development of digital education resources.

Wang et al. (2019, p.68-76) pointed out that the utilization of digital educational resources supports the maintenance of a high level of teaching quality in rural and remote areas of China. The study collected and analyzed data from 462

teachers in 25 primary and secondary schools in rural areas through a questionnaire survey. This led to the discovery of teachers' digital educational resources (DERs) use as well as school and teacher-level factors that may influence teachers' access to DERs. One of the main reasons for this was the dominant role of electronic lesson plans and multimedia courseware in the delivery of lessons, despite the utilization of various digital educational resources.

Bilalova et al. (2020, p.315) noted that the use of digital educational resources in the learning process enriches the learning tools and makes the course interesting. As can be seen in practice, the digitalization of higher education has led to changes in the qualification requirements of the teaching staff. Many universities have started to develop new forms of knowledge transfer, mainly distance courses, online courses.

Drozdikova et al. (2020) noted that the process of digital education must take into account the trends of scientific and technological progress and the requirements of society for the quality of educational services. Purposeful use of digital educational resources is one of the most effective methods. The flipped classroom, for example, is a modern educational technology that contemplates "blended learning" based on the concept of combining "classroom system" technology with digital teaching technology. ICT and modern teaching methods offer new teaching possibilities. Different subjects are able to diversify into flipped classes through the production of digital educational resources.

Rodes-Paragarino et al. (2016, p. 73) pointed out that digital educational resources have reached significant levels of development and diversification as an integral part of the transformation of higher education.

Wang and Lee (2020, p.1217) suggested that advancing digital education initiatives can be done through adoption in educational environments, the proliferation of online learning platforms, and the way in which digital resources are integrated with curriculum and instruction.

Wang et al. (2021, p.68-76) mentioned that sharing pedagogically relevant knowledge and making digital resources available to all students is paramount. Digital educational resources, such as teaching materials, software and tools used in teaching practice, are an important source of teaching-related knowledge that primary and

secondary school teachers share with others in the process of digital education transformation.

Patel and Garcia (2021, p.90) argued that digital educational resources have a significant impact on digital educational outcomes. For example various types of digital resources (including multimedia materials, interactive simulations, online tutorials, and educational games) perform differently in increasing student engagement, understanding, and achievement across subjects and grade levels.

Raipovna (2021, p.152) believed that MOOC is a very typical digital educational resource. The main stages of expanding the educational environment are considered based on foreign experience, which not only demonstrates the advantages of digitizing education and introducing open online courses (MOOC), but also points out the main issues to be considered when expanding the educational environment.

Chen and Wang (2022) suggested that a collaborative approach to creating, sharing, and disseminating digital educational resources among educators, institutions, and stakeholders has many benefits. Fostering collaboration, utilizing collective expertise, and building sustainable digital resource repositories can facilitate innovative practices in the digital age.

Wang Mengmeng (2022, p.90-96) proposed digital educational resources to utilize digital technology to develop inclusive education so that all citizens will be able to pursue a better life and achieve all-round development. Through lifelong learning, it is possible to achieve the goals of win-win sharing and openness and inclusiveness, and to promote social equity and democracy.

Luo and Zhang (2023) emphasized that digital educational resources play an important role in the process of promoting the high-quality development of education. Aggregating high-quality, systematic and multi-type digital educational resources can effectively promote the digitization of educational resources and the fairness of allocation, and can meet the needs of learners' personalized choices. In the era of artificial intelligence, how to make digital educational resources from the previous let people adapt to actively adapt to people is the key way forward to promote the development of digital educational resources.

Johnson and Smith (2023) proposed that the role of digital resources in enhancing the teaching and learning experience, meeting the needs of diverse learners, and facilitating engagement and collaboration. In addition, factors such as the digital divide, resource quality, accessibility, and sustainability can provide educators and policymakers with recommendations to maximize the effectiveness of digital educational resources.

In conclusion, digital educational resources are a product of the digital age, a new way of learning that integrates technology and education. Digital educational resources refer to the digitization of educational content so that students can better acquire knowledge, experience and literacy. Digital educational resources have a wide range of adaptability and can be used not only in traditional classrooms, but also in a variety of educational modalities, such as online education, distance education, and personalized education. Digital educational resources have greatly expanded the channels and scope of education, providing more learning options and opportunities. The types of digital educational resources are also very rich, including digital textbooks, online courses, teaching games, digital lesson plans, simulation experiments, multimedia courseware and so on. Digital educational content not only makes teaching more vivid, graphic, concrete and interactive, but also has the characteristics of timeliness, easy updating. It can be implemented in a variety of ways, either by teaching colleges and schools to build digital educational resource libraries, or by individuals or groups to develop. The construction of digital educational resources requires some technical and managerial knowledge, such as the production, storage, distribution and use of digital educational resources, which require corresponding technical support and management. The application of digital educational resources plays a great role in improving the quality and efficiency of education. Digital educational resources can meet the learning needs of different students, promote students' active learning and exercise their comprehensive quality.

Concept of Digital Technologies

Digital technologies drive innovation in education, enabling diverse tools like online platforms, multimedia resources, virtual reality, and AI applications. They enhance learning accessibility, flexibility, and effectiveness, supporting real-time feedback and adaptive teaching strategies. Addressing equity issues, they expand learning opportunities across diverse demographics, despite challenges like digital literacy and privacy concerns, thereby transforming education towards inclusivity and engagement.

Chen (2019) suggested that the advantages and characteristics of digital technology should be brought into full play to promote the transformation of the education model to quality education, so as to truly build a digital education system for comprehensive training in the new era.

Park and Kim (2019, p.169-183) proposed digital technologies in education has a huge impact on educational equity and inclusion. For example, some groups may not be able to take full advantage of the educational opportunities offered by digital technology, which may involve inequalities in terms of access to digital devices, digital literacy levels, and so on. In view of the fact that digital technology is one of the most important means of promoting greater equity and inclusion in education systems in the context of digital education initiatives, it is recommended that consideration be given to upgrading initiatives in terms of government investment, educational resourcing and training in digital technologies.

Jiang Yumei (2020, p.119) proposed that the widespread and profound application of information technology in digital education has contributed to the emergence of digital education initiatives. The continuous upgrading of digital education is the process of developing educational resources and optimizing education through the universal application of modern digital technology in the educational process. Digital education initiatives are intended to cultivate and improve students' information literacy, thus contributing to the realization of digital education.

Chen and Johnson (2020, p.634-651) considering the various opportunities that digital technologies bring in digital education, including the opportunities in personalized learning, teaching innovation, and learning effectiveness enhancement.

At the same time, digital technologies also face various challenges, such as technical facilities, teacher training, and curriculum design.

Jiang Yuemei (2020, p.124) proposed that the digital technologies represented by artificial intelligence, big data, cloud computing and the Internet of Things (IOT) is now widely and deeply applied in all industries. This has not only driven deep changes in the industry, but also brought about profound changes in our work, learning and life. Information technology has also been widely used in digital education, and the deep integration of information technology and education has been transformed from the start of a new development stage. It has promoted the updating of education concepts, the transformation of education models and the reconstruction of the digital education system.

Liu and Smith (2021, p12) pointed out that the current emerging digital technologies used in digital education are virtual reality, augmented reality, artificial intelligence, and blockchain. Digital technologies have a great impact on learning outcomes, teaching effectiveness, and management efficiency. There are challenges and issues faced when applying emerging digital technologies in digital education initiatives, such as technology maturity, teacher training, privacy and security concerns.

Wang and Lee (2020, p.1217) proposed that different types of digital technologies are used in digital education in different ways. For example, the application of digital technologies in education management (student management system, faculty management system, data analysis tools, etc.), there is an impact of these technologies on management efficiency and decision making. Increasing efficiency and reducing the cost of education are among the challenges faced by digital technologies in digital education initiatives.

Yu et al. (2023, p.18-23) mentioned that digital transformation of higher education colleges requires advanced digital technologies. The digitalization of vocational education is not a simple addition of vocational education and digital technology. It is the application form of the organic integration of digital technology and vocational education at the level of technical form and physical platform, and then realizes the goal of cultivating digital high-quality technical and skilled talents, and builds a digital all-factor interactive parenting framework.

Ding Xiaojiong (2023, p.8) believed that digital technologies are controlled by the human being implies that individuals need to understand the fundamentals of digital technologies.

Weng Weibin (2023, p.102-109) believed that high-quality development of education requires digital technologies as the basis for the construction of digitization, which provides new momentum for high-quality development of education. Digital technology facilitates better decision-making in education by incorporating educational facts into the digital system, forming standardized and formatted cognitive knowledge and providing an accurate portrait of the state of education and its problems. The management is able to monitor, organize and deploy the elements of the educational development process through digitalization. Digital technologies have their powerful ability to promote the high quality development of education. However, the emphasis on governance initiatives in the quality development of education should be in line with specific practical demands. For the administrators of education, digital technologies provide important knowledge support for governance by capturing timely changes in the dynamics of ubiquitous education and providing universal knowledge.

In conclusion, digital technologies play a pivotal role in advancing digital education initiatives, serving as the backbone for innovation and transformation in educational practices. These technologies encompass a wide array of tools and platforms, such as online learning management systems, interactive multimedia resources, virtual reality simulations, and artificial intelligence-driven applications. By leveraging digital technologies, digital education initiatives aim to enhance the accessibility, flexibility, and effectiveness of learning experiences for students of all ages and backgrounds. Additionally, digital technologies support formative assessment techniques, real-time feedback mechanisms, and data-driven decision-making processes, empowering educators to monitor student progress and adapt instructional strategies accordingly. Furthermore, digital technologies are instrumental in addressing educational equity issues by bridging geographical and socioeconomic barriers to learning. They enable remote and asynchronous learning opportunities, reaching under-served populations and facilitating lifelong learning endeavors. However, challenges such as the digital divide, digital literacy gaps, and ensuring data privacy

and security remain pertinent considerations in the effective integration of digital technologies into education. Nonetheless, by embracing digital technologies strategically and indicatively, digital education initiatives hold immense potential to revolutionize teaching and learning paradigms, fostering a more inclusive, engaging, and equitable educational landscape.

Concept of Digital Transformation of Education

Transforming digital education is key to enhancing lifelong learning mechanisms. It accelerates education modernization, excellence, and public satisfaction by embracing digitization, intelligence, and integration trends. Attention must focus on creating inclusive learning platforms and gathering quality resources accessible to all, fostering personalized and lifelong learning opportunities.

Xu (2017, p.98) mentioned a series of National Education Technology Plans (NETPs) released in the United States, which have continued to increase the focus on the sustainable development of digital education. Among them, NETP2010 proposes to provide basic learning facilities for every student and educator, including human resources, learning resources, related policies, and so on. A 21st century education technology development model of technology-driven learning was constructed. The sustainable development system for the purpose of learning, assessment, teaching, improvement of infrastructure and productivity was formed. Released in 2014, the U.S. Federal Department of Education Strategic Plan (FY2014-2018) proposes the continued improvement of the data system and digital education system in order to create a culture of sustainability.

Yang and Ren (2017, p.28) emphasized that transformation of digital education inside the cultivation of digital education system is inseparable from the support of educational administrators and teachers. This is illustrated in the following three areas. Firstly, the roles of the team of administrators and the team of teachers in a fully developed digital education system require repositioning. For example, education administrators, especially directors and school principals in the field of digital education, should not only act as administrators, designers and decision-makers. It is also necessary to be familiar with the relevant policies on digital education, to be

sensitive to the direction of development of new digital technologies, and to be professional in formulating strategies for the development of digital education in the region and in the school. It is important to make absolutely sure that the decisions are not made to build blindly. Faculty members of subjects related to digital education should be the vanguard and pioneers in the construction of the system, and should insist on researching and exploring and familiarizing themselves with the latest development of new technologies while taking good IT classes. In addition, exploring solutions for the integration of digital technology and education and teaching that are suitable for the region and the school, and organizing appropriate training to strengthen the information literacy and hands-on skills of the teaching staff. Teachers of other subjects should be applicators and enthusiasts. Teachers of other subjects are expected to make full use of digital technology tools as an aid to changing teaching and learning, and to use the platform of the EMB to take the initiative to promote the digital development of schools. The second is to strengthen the training of teachers in the application of information technology. Teachers in the new era should possess basic digital technology literacy, be adept at using digital technology to teach and analyze learning conditions, and gradually transition from empirical to scientific teaching. Particularly, the capacity to use digital technology to integrate into subject education, moral education work, as well as aesthetic, physical education and even labor education curricula. Finally, the coordination of regional teacher training should be strengthened. Provinces and cities with the conditions can set up a team of specialized personnel to provide direct technical support for the development of regional digital education and establish a technical support resource base. Observation and exchange of teachers between regions will be realized through the transformation of digital education.

Zhang (2018, p.411) proposed that under the trend of the transformation of digital education, the construction of a comprehensive cultivation of the education system will certainly become a key step in digital education initiatives, and the design of the new education system is bound to include digital education considerations in the top-level design.

Ren Youqun (2019) noted that the connotation of a higher level talent cultivation system is far-reaching. The construction of its various components requires the participation of a new generation of digital technology and the support of a higher level of digital education. Development as a necessary path to form a higher level of digital education talent training system is a consensus today that does not need to be pointed out in particular.

Liu (2021, p. 1750) suggested that the impact of technological progress on labor and employment has been a traditional topic since the recent industrial revolution. Currently, the new technological revolution represented by digital technology is profoundly changing the world. From the current state of research abroad, it can be found that foreign research on the subject has been very mature, to achieve a full range of software and hardware applications in modern, information-based education, many products have been put into use, these research aspects are for China to achieve information technology, intelligent education to provide reference.

Li and Fan (2022, p.16-20) proposed the concept of promoting the move from education management to education governance. The construction of a digital education ecosystem requires overcoming the challenges of management inertia and conceptual inertia carried over from the industrial era, and shifting to a modernized conceptual system and logical system of governance in the digital era. From administration to governance means flattening, diversification, systematization, and the combination of top-down and bottom-up. Promoting the formation of a digital education governance system through digital technology and digital thinking is a key element in supporting digital education initiatives.

Patel and Nguyen (2020, p.89-104) pointed out that the impact of digital education initiatives on educational transformation, changes in teaching and learning models, and student learning outcomes varies in different regions and institutions. The implementation strategies and measures of digital education initiatives need to be adapted to the local context.

Wang Mengmeng (2022, p.90-96) suggested that comprehensively upgrading digital skills and strengthening transformation of digital education are key steps to

comprehensively promote digital skills such as data mining, content expansion, and tool development. For example, the EU-funded Digital Skill Up program provides free online courses to help European citizens and SMEs to upgrade and re-engineer their skills in digital transformation. Further, digital education system construction should be promoted as soon as possible. For example, the European Institute of Innovation and Technology (EIT) organizes blackthorns for online educational platform development through competitions. A representative winning project is the STEM digital collaboration platform for Italian high school and university students, which promotes skills upgrading through collaborative distance learning in virtual laboratories. Moreover, the digital education action plan proposed by the EU reflects the lessons learned from the outbreak of the COVID-19 pandemic. Hence the action plans to improve digital capacity for digital transformation and to create an efficient digital education ecosystem. It states that human resources policies are more important than ever in preparing for and taking the necessary measures for economic recovery and rehabilitation.

Yu et al. (2023, p.18-23) mentioned that digital transformation of higher education colleges is an inevitable choice for the development of higher education. It is proposed that the current digital transformation of higher vocational colleges faces dilemmas such as cognitive misinterpretation and misinterpretation, unsound supporting systems, and narrow resource input channels. The development of the digital economy provides higher vocational colleges and universities with the opportunity to promote the talent training mode and seize the development opportunities. However, the overall quality and level of digitization of higher vocational colleges and universities cannot meet the development requirements of the digital era. The pressure of survival in the digital era is great, and the degree of competition is fierce. If higher vocational colleges and universities want to win the comparative advantage of survival and development, they must plan the digital transformation and upgrading program in advance, deepen the reform of talent cultivation, improve the quality of talent cultivation, and proactively seize the economic and social development opportunities in the digital era.

Smith and Brown (2023, p.45-58) proposed the growing popularity and use of digital education in schools and colleges. The role that digital education has played in changing traditional teaching and learning methods, improving teaching and learning efficiency, and facilitating the student learning experience. However, the development of educational digital transformation still faces great challenges.

Yang Yanfeng (2023, p.69-71) believed that the department of Vocational and Adult Education of the Ministry of Education of China has indicated that it will build a "1+5" system for the digitization of vocational education, namely, a vocational education decision-making brain system and a decision-support center, a professional teaching resources center, a center for high-quality online open courses, a center for virtual simulation internships and training and a center for the enhancement of the governance capacity of vocational schools. This is to drive changes in teaching mode and governance with digital transformation as a whole. The digital transformation of vocational education has become a development consensus and conscious action.

In conclusion, transformation of digital education is the crucial key to improving the mechanism for promoting lifelong learning for all. The transformation of digital education is a major assignment for accelerating the modernization of education, educational excellence, and the satisfaction of the public with education. In the era of digital education, it is necessary to take the initiative to adapt to the development trend of digitization, intelligence, lifelong learning and integration. Furthermore, two issues that need attention are how to gather high-quality learning resources for the whole society and build a public service platform for lifelong learning for all. Such a digital education system will be able to satisfy the diversified and personalized learning needs of members of society. For example, the construction of a credit bank enables everyone to learn, to learn everywhere and to learn all the time. The ultimate goal is to make education an education that accompanies everyone throughout their lives, an education that is equally oriented towards everyone, an education that suits everyone, and an education that is more open and flexible.

Concept of Digital Literacy

Digital literacy varies in interpretation but generally encompasses technical skills, knowledge, ethical awareness, and problem-solving abilities crucial in the digital age. It evolves toward a comprehensive, multi-dimensional concept, essential for learning, working, and living in a digital society.

Paul Gilster (1997, p.1) defined digital literacy as the ability to understand and use the wide range of resources available on computers in a variety of forms. Digital literacy is also related to the earlier information literacy, whether it is digital literacy, information literacy, cuber literacy, computer literacy, these terms have different definitions and connotations, and the point in time and frequency of each name varies. Digital literacy is defined as the ability to utilize cognitive and technical skills to locate, evaluate, create and communicate information using information and communication technologies. It can also be understood as the ability to use computers and online resources to locate, organize, understand, evaluate and analyses information.

Martin and Grudziecki (2006, p.249) stated that digital literacy has become a key factor not only for participation in social life such as education and employment, but also as a means to gain some understanding of the world.

Xiao (2006, p.32-33) believed that in the design of online learning environments, it is necessary to fully consider the relevant digital skills and their nature, the interrelationships between skills, and the implications for teaching and learning, etc. That is to say, digital literacy cannot be viewed simply as a purely technical skill, but also involves cognitive skills, affective skills, social skills, and even pedagogical theoretical potential for application.

UNESCO (2011) stated that digital literacy goes well beyond basic skills in handling computers, and that it encompasses the use and production of digital media, information processing and retrieval, participation in social networks for creating and sharing knowledge, and a wide range of specialized computing skills.

Li (2012, p.9) pointed out that compared with traditional media literacy, the composition of digital literacy is more complex and comprehensive, so its development is also more difficult. As a basic literacy in the digital era, digital literacy

requires not only professional education, but also the accumulation of practical experience over a long period of time.

Wang et al. (2013, p.24-29) emphasized that digital literacy is the sublimation and expansion of information literacy in the digital age. The concept of literacy itself is a dynamic and open concept that is constantly evolving and enriching. When a life behavior or way of life becomes more and more popularized and its influence deepens, the role or value of the traditional literacy content is increasingly marginalized, and its educational effect gradually diminishes, so there is an objective need to propose and advocate a new kind of literacy requirements to adapt to it. It can be said that "digital literacy" is also proposed on the basis of other kinds of literacy concepts.

Reddy et al. (2020, p.65) conducted that individuals need a wide range of competencies, capabilities and skills to adapt to the technological age. The concept of digital literacy has been introduced through ICT developments. The contribution of digital literacy to the realization of the sustainable development goals and the development of the education sector is an important part.

The International Federation of Library Associations and Colleges (IFLA) (2017) defined digital literacy as the ability to make the best use of digital tools, requiring that people can efficiently and ethically use technology to meet the needs of their personal, civic, and professional lives.

Xu and Shang (2017, p.98-106) pointed out that Chinese digital literacy education has achieved certain results, but overall the current development is still very imperfect. Theoretically, a mature system has not yet been established, digital literacy has not been given due attention, and its concept presents a status quo of vague definition.

Brown and Xiao (2018, p.42-53) suggested that the goal of developing digital literacy must be closely tied to empowerment, so that both individuals and collectives can feel more energized to help solve some of the larger problems facing the future of humanity in a world of uncertainty.

Su and Peng (2021, p.27) proposed that most of the studies on digital literacy in China refer to foreign frameworks, assessment standards and practice cases, but no

systematic localized theoretical system has been established, and few studies have assessed the digital literacy level of Chinese residents. According to the theory of empowerment, technological empowerment can help improve the social participation ability, self-efficacy and control of the empowered subjects.

Reddy et al. (2022, p.570) believed that people living in the twenty-first century must adapt, adopt and accommodate the new normal of surviving and thriving in a digital society. Not only do people need to become consumers of digital innovations, but they also need to have relevant digital literacy. This is so that they can accomplish tasks with optimized outputs and respond effectively to the digital change chain.

Jiang and Zhai (2022, p.54) emphasized that to adapt to the rapid changes in the digital era, the digital literacy of citizens needs to be improved urgently. The Outline of the Fourteenth Five-Year Plan for the National Economic and Social Development of the People's Republic of China and the Vision 2035 emphasizes "strengthening education and training in digital skills for the whole population, and popularizing and improving citizens' digital literacy". Chinese digital literacy content frameworks should not be simply borrowed and copied directly from foreign imports, but should be constructed in a way that is appropriate to national conditions and matches the mission of the entire population to participate in the building of a digital China.

Samaniego (2023, p.68) pointed out that there are five conceptual categories of digital literacy: functional, sociocultural, critical, transformative, and socio-material.

Demirtas (2023, pp. 207-221) stated that rapid advances in digital technology require individuals to have certain skills and abilities to perform tasks and solve problems in a digital environment. Digital literacy is the skills that 21st century individuals need to use digital tools to support them in achieving their goals. This concept reflects the fact that digital literacy is the skills people need to access information, communicate and interact with others, find employment, achieve economic success, and actively participate in collaborative networks. Digital literacy education refers to the process of building knowledge and skills through education and practice.

Zhu et al. (2024, p.113-120) pointed out that how to develop new needs based on teachers' digital literacy development and new technological innovation of artificial intelligence has become the focus of attention in the academic community. Under the background of education digital transformation, the new needs of teachers' digital literacy development and the new technology of artificial intelligence promote the change of teachers' digital literacy assessment paradigm, objectives, means, content and data, and the digital literacy assessment develops in the direction of intelligence, precision and accompaniment.

Ke et al. (2024, p.5-12). considered the United States as an early country to focus on the development of students' digital literacy and skills, the American Association of School Librarians and the Association for Educational Communications and Technology jointly released the Information Literacy Standards for Student Learning in 1998, which provided a conceptual framework and guidelines for information literacy education in American elementary and secondary schools. Digital literacy for students is now recognized by many educational powers as a basic survival skill in the digital age. Basic literacy in the digital age consists of four main components: basic literacy in the digital age, creative thinking, effective communication and quality and efficient output.

In conclusion, although the interpretation of digital literacy varies among different organizations or scholars, they all emphasize that its connotation extends from digital technical skills to attitudes, knowledge, abilities, ethical awareness, and other aspects required for problem solving in the digital age. It can be seen that digital literacy is evolving gradually with the development of the times towards a diversified, multi-level and comprehensive concept. At this critical stage of digital transformation, the outline for action to enhance digital literacy and skills for all points out that digital literacy in China is the comprehensive literacy that citizens in a digital society should have for learning, working and living.

Concept of Financial Inputs

Financial inputs are crucial for digital education initiatives, supporting infrastructure, training, content, and program development. They enable schools to integrate technology effectively, empower educators, and adapt programs to evolving needs. However, challenges arise with inadequate or unequal funding, impacting accessibility and quality. Therefore, ensuring sufficient and equitable financial support is vital for successful and sustainable digital education, enhancing educational opportunities for all learners.

Wang (1995) believed that in terms of financial inputs to education, the important problems faced by China are, firstly, the shortage of investment in education and the insufficient allocation of funds by the government to education, which affects the realization of the goals of education development and, secondly, the low efficiency of the utilization of the limited investment in education. A college evaluation agency is a social intermediary organization between the government and the college, composed of relevant experts, whose function is to carry out comprehensive evaluation and special evaluation of colleges and universities. As far as financial inputs are concerned, the efficiency and effectiveness of the utilization of the university resources are assessed on the basis of a system of evaluation indicators, the university is classified into a number of grades, which are made public and serve as a basis for the allocation of funds, and the assessments are held on a regular basis.

Shi (2004, pp.32-34) believed that the role of public finance is to make up for the "failure" of market allocation of resources, and to promote social equity and long-term development of the country. The establishment of a new education investment mechanism in accordance with the requirements of public finance can fundamentally avoid the tendency of utilitarian government investment behavior. In addition, the implementation of financial sharing at all levels is also a major way to realize the equitable allocation of public goods and services by public finance.

Zhang (2006, p.5-7) suggested that financial inputs are the most important financial resources for the development of vocational education, which is the guarantee for vocational education. Insufficient funding is the most fatal bottleneck that restricts the development of higher vocational education. To optimize the

financial inputs of vocational education, it is necessary to establish and improve the financial supply system of higher vocational education which is the main channel of the government, and to increase the financial inputs to vocational education according to the law. Secondly, we should stabilize the current charges on tuition income and with the improvement of people's economic income and living standard, gradually raise the charges, and appropriately increase the proportion of tuition in the cultivation cost. Third, we should mobilize the resource channels of the whole society, activate the social capital, improve the financing level, and break through the bottleneck of the constraints of education investment, so that the capital market of vocational education releases more energy and vitality. Fourth, we should tap the strength of enterprise investment in higher vocational education. Fifth, we should increase the socialization reform of logistics in vocational colleges and universities, and attract social funds to participate in the construction and management of school dormitories and canteens, so as to alleviate the pressure of tight school funds. Sixth, we should further innovate the way of bank-school matching, improve the mechanism of bank-school cooperation, banks should actively issue credit student loans, to ensure that students with financial difficulties successfully complete their studies. Seven, financial institutions in the province to establish awards in lieu of special funds to focus on supporting the construction of model vocational colleges and universities, the construction of key professions, sharing the construction of training bases. Eighth, it should actively explore ways and mechanisms to absorb foreign funds and private capital to develop vocational education and training.

Dai (2007, p.14-16) proposed to increase financial inputs through multiple channels, the establishment of vocational education student financial aid system, continue to increase the central and local financial vocational education special funds and vocational education special capital funds, focusing on support for the construction of skills shortage of personnel specialties, vocational education teacher training and training, agriculture and other hard industries, rural areas in central and western China and ethnic minority areas of the development of vocational education. The development of vocational education is unbalanced, the investment in it is relatively insufficient, the conditions for running a school are poor, the scale, structure,

quality and effectiveness of vocational education are not yet able to meet the needs of economic and social development, and there are still a number of deep-rooted problems in the institutional and operational mechanisms that have not been resolved.

Wang (2008, p.119-121) pointed out that under the current system of education funding budget level is relatively low, the education of the Ministry of Education, education of the financial authority of the financial and planning departments of education, the separation of the Ministry of Education and financial authority. This has resulted in the following problems: First, the amount of education budget is relatively flexible and lacks transparency. Secondly, there is disconnecting between the development of education and the government's allocation of funds to education. The third is that the education department cannot effectively exercise the macro management and regulation of education, resulting in a waste of educational resources. Financial resources and authority are the material basis for the authority.

Garcia and Rodriguez (2017, p.92-104) pointed out that the gaps between urban and rural schools in the use of digital education, and the role of financial input in reducing these gaps is very significant. In addition, the study concluded that urban and rural schools face significant challenges in effectively utilizing financial resources for digital education activities.

Wang and Liu (2018, p.215) believed that assessing financial inputs has a significant impact on digital education outcomes. Different levels of financial inputs in digital education initiatives are associated with specific educational outcomes such as student achievement, digital literacy, engagement, and access to educational resources. In addition, the effectiveness of different types of financial inputs (e.g., those for infrastructure, technology acquisition, teacher training, and curriculum development) in achieving desired educational outcomes varies. The study also highlights socio-economic status, school characteristics and policy context as key factors moderating or moderating the relationship between financial inputs and digital education outcomes.

Patel and Jackson (2019, p.243-259) presented that financial resources for digital education initiatives suffers from budgetary constraints, competing funding priorities, lack of funding transparency, and difficulties in optimizing resource allocation. Strategies to overcome the difficulties can include: increasing funding, developing cost-effective digital education solutions, fostering collaboration with stakeholders, and implementing efficient budget management practices.

Nguyen and Lee (2020, p.8) pointed out that the impact of financial inputs on the outcomes of digital education is multifaceted, which can improve the quality and effectiveness of digital education in general by improving educational resources, upgrading teachers, innovating teaching modes, and improving students' learning experience.

Martinez and Garcia (2021, p.8) recommended that the government and relevant organizations increase financial inputs to low-income school districts to support the construction of digital education facilities, the upgrading of technological equipment, and the acquisition of educational resources to ensure that schools are able to provide high-quality digital education services. Equitable resource allocation policies should also be formulated and implemented to ensure that digital education resources can be equitably distributed to each school and student, and to narrow the gap in digital education resources between different school districts. In addition, funds are invested in digital education training for teachers to improve their ability and capacity to use digital technology for teaching and to ensure the effective use of educational resources. Lastly, there is a need to establish a monitoring and evaluation mechanism to regularly assess the impact and effectiveness of financial inputs on the equity of digital education, and to make timely adjustments to policies and measures, so as to ensure that financial inputs can effectively support the development of digital education.

Brown and Johnson (2022, p.167) suggested that there is a correlation between the level of financial inputs and the outcomes of digital education initiatives. Initiatives with higher inputs may tend to achieve better outcomes. The key factors affecting the effectiveness of financial inputs to digital education programs are the size of the inputs, the method of inputs, and the management of the inputs.

Recommendations for future digital education initiatives are provided below: Optimization of financial input strategies: It is recommended that governments and educational institutions optimize their financial input strategies to ensure that inputs match project goals and needs. This may include better planning and management of funds, ensuring that resources are allocated appropriately, and prioritizing the maximization of impact on education quality and student learning outcomes. Establishment of a mechanism for evaluating the effectiveness of inputs: It is recommended that a sound mechanism for evaluating the effectiveness of financial inputs be established to regularly monitor and evaluate the inputs and outputs of digital education projects. This will help identify problems and optimize the use of resources in a timely manner and improve the effectiveness of inputs. Promote cooperation and sharing: It is recommended to promote cooperation and resource sharing among various parties, including the government, educational institutions, enterprises and social organizations. By establishing partnerships, resources from all parties can be fully utilized to reduce project implementation costs and improve efficiency and effectiveness. Teacher training and support: It is recommended that digital literacy training and support for teachers be strengthened to enhance their competence and confidence in the field of digital education. This can be achieved through the provision of specialized training courses, resources and technical support to ensure that teachers are able to teach effectively with digital technologies. Student engagement and personalized learning: It is recommended to focus on the engagement and personalized learning needs of students by providing them with diversified learning resources and platforms in digital education projects and encouraging their active participation and exploration. Continuous Innovation and Improvement: It is recommended that digital education initiatives maintain continuous innovation and improvement, adopt new technologies and teaching methods in a timely manner, and continuously adapt to and meet the needs and challenges of educational development. Social consensus and support: It is recommended that the awareness and support of digital education from all sectors of the community be strengthened, and that a favorable social atmosphere and public opinion environment

be created to provide strong support for the promotion and development of digital education.

Smith and Jones (2023, p.289) proposed that financial inputs in the field of digital education not only promote the digital transformation and modernization of the education sector, but also provide important support for education reform and enhancement of teaching quality, and promote equity and inclusion in education. In recent years, with the rapid development and popularization of digital technology, financial input in the field of digital education has shown a trend of steady growth. Governments, educational institutions and enterprises have increased their investment in digital education programs. The financial investment has been characterized by diversification, including government appropriation, educational institutions' own funds, corporate sponsorship and other forms. The investment is mainly focused on the development and updating of digital teaching resources, teacher training and development, campus network construction, and equipment purchase and maintenance.

In conclusion, financial inputs play a pivotal role in shaping digital education initiatives, serving as the cornerstone for their successful implementation and sustainability. These inputs encompass funding allocations for various components such as technological infrastructure, staff training, content development, and program evaluation. Adequate financial resources enable educational institutions to acquire necessary hardware, software, and digital tools, facilitating the integration of technology into teaching and learning processes. Moreover, financial investments support capacity building initiatives for educators, empowering them to effectively utilize digital resources and pedagogic in the classroom. Additionally, funding ensures the continuous improvement and adaptation of digital education programs to meet evolving needs and technological advancements. However, challenges arise when financial inputs are insufficient or inequitably distributed, hindering the accessibility and quality of digital education. Therefore, ensuring adequate and equitable financial support is essential for fostering the success and sustainability of digital education initiatives, thereby advancing educational outcomes and opportunities for all learners.

Concept of Effectiveness of Education Policy Implementation

Effective education policy implementation is crucial for maximizing digital education initiatives. It ensures coherence, equity, accountability, and innovation in program design, delivery, and evaluation, promoting educational outcomes and opportunities in the digital era.

Tang (2004) proposed that in order to ensure and promote the sustained, healthy and scientific development of education policy implementation, there is a need to have a systematic, scientific and complete policies and regulations to comprehensively regulate the organization and behavior, but the development and improvement of these policies and regulations need to be carried out through a certain organization, in accordance with a certain procedure, according to the corresponding content. This requires the establishment of a set of systematic and generalized policy and regulation system models that can be used as a guide for policy and regulation makers.

Yang (2008, p.30-35) believed that the conflict and collaboration between centralization and decentralization can be dealt with by reintegrating the problems highlighted in the implementation of education management policies and the related policy elements, and that strengthening "top-down and bottom-up" cooperation is the trend in the development of basic education management policies in the United States. Not only is it necessary to clarify the responsibilities and obligations of each party, but it is also necessary to establish a real cooperative relationship and good information communication channels between each other.

Zhang (2010, p.19) suggested that the healthy development of China's regional economy and community building requires education to be involved and play an important role. This makes the relationship between higher education and the region and community will be closer. For this reason, policy implementation should be tailored to determine the structure, development mode and layout planning of higher education in the region.

Yang (2014, p.63-67) considered that China's education-related policy implementation still exists from epithet to connotation, from spontaneity and disorder to consciousness and standardization, from efficiency priority and taking into account

fairness to fairness priority and taking into account the efficiency of the conversion of value orientation, as well as emphasis on the entity, light procedure, legislation, light implementation, management, light governance, and other value orientations.

Smith and Brown (2016, p.432) highlighted the role of leadership in advocating for digital education policies and garnering support from stakeholders. It analyzes the strategies used by leaders to communicate the rationale, objectives, and benefits of digital education reforms, mobilize resources, and build consensus among policymakers, educators, parents, and the community. The study emphasizes the importance of visionary leadership in articulating a compelling vision for digital education and driving change initiatives. Visionary leaders not only inspire innovation and foster a culture of continuous improvement, but also align organizational goals and strategies with a broader vision of digital transformation in education.

Garcia and Rodriguez (2017, p.92-104) highlighted the disparity between policy formulation and implementation processes in digital education. It identifies challenges related to translating policy intentions into actionable strategies and practices at the grassroots level, often due to institutional barriers, resource constraints, and inadequate capacity among stakeholders. It examined microeconomics, political, cultural, and infrastructural factors that shape the implementation landscape and impact the effectiveness of digital education initiatives. The study underscores the importance of capacity building initiatives to address challenges in digital education policy implementation. It identifies gaps in knowledge, skills, infrastructure, and resources among stakeholders, emphasizing the need for targeted training programs, technical assistance, and professional development to enhance implementation capacity.

Huang (2017, p.6) believed that there are a lot of problems in decentralizing the power of specific school running and management to localities, and the central government is only responsible for macro-control, planning and formulating large policy implementation. In this regard, it is necessary to attract sufficient attention and carry out adequate research, and jointly promote the reform of education management in all aspects of the simultaneous progress.

Patel and Kumar (2018, p.423) highlighted lessons learned from the Indian context regarding the importance of policy coherence for effective digital education implementation. It identifies success stories, best practices, and areas for improvement in policy coordination and coherence, drawing insights from policy experiences at the national, state, and local levels. These recommendations may include specific actions to strengthen coordination mechanisms, streamline policy frameworks, enhance stakeholder engagement, allocate resources strategically, address capacity gaps, and promote innovation and sustainability in digital education initiatives.

Nguyen and Chen (2019, p.345) identified and analyzes various policy implementation models employed by European countries to implement digital education initiatives. These models may include top-down approaches driven by centralized government policies, bottom-up approaches involving local autonomy and grassroots initiatives, hybrid models combining elements of both approaches, or collaborative models emphasizing partnership and co-creation between multiple stakeholders. It also explored key drivers that contribute to the successful implementation of digital education policies, such as strong political leadership, clear policy goals and priorities, adequate resource allocation, effective coordination mechanisms, supportive regulatory frameworks, and stakeholder engagement.

Sang and Zheng (2019, p.7-13) argued that in the course of exploring, establishing, deepening and improving policies and regulations, the value concepts embodied in them have gradually transitioned from pragmatic utilitarianism to emphasizing individual need fulfillment, and finally evolved to focus not only on individual learning need fulfillment, but also on inclusiveness.

Brown and Taylor (2020, p.503-519) highlighted the importance of policy coherence in shaping the effectiveness and success of digital education implementation efforts. It also highlighted the need for integrated, coherent, and contextually relevant policies to address the complex challenges and opportunities associated with digital transformation in education. Additionally, it deeply highlighted the importance of policy coherence in promoting alignment, coordination, and consistency across different aspects of digital education initiatives. It suggests that coherent policies can enhance clarity, effectiveness, and efficiency in implementation

processes, facilitate stakeholder collaboration, and contribute to the achievement of desired outcomes and goals.

Wang and Zhang (2021, p.8) considered that recommendations to address the challenges facing rural schools and improve policy implementation include strategies to enhance infrastructure development, strengthen teacher training programs, increase resource allocation, promote curricular innovation, promote equity and access, and build local capacity for policy implementation. It contributes to a better understanding of the complex challenges facing policy implementation in digital education, particularly in the context of rural schools in China. It underscores the importance of addressing these challenges to ensure the successful implementation and meaningful impact of digital education policies in rural communities.

Kim and Lee (2022, p.102) pointed out that the policy instruments employed by South Korea and the United States to promote digital education initiatives. These instruments may include legislation, regulations, funding mechanisms, incentives, and support programs aimed at facilitating the adoption and integration of digital technologies in education. Moreover, it identified common challenges and success factors encountered in the policy implementation process in both countries. These may include issues related to funding, infrastructure, teacher training, curriculum development, stakeholder coordination, and evaluation mechanisms.

Jones and Smith (2023, p.321-335) highlighted factors associated with successful policy implementation, such as strong leadership, adequate resources, supportive school culture, and collaboration among stakeholders. These factors contribute to the effective integration of digital education initiatives into school practices. Additionally, there are common challenges and barriers encountered during the implementation process, such as resistance to change, lack of teacher expertise, insufficient funding, and technological limitations. Understanding these challenges is essential for developing effective implementation strategies.

In conclusion, the effectiveness of education policy implementation is essential for realizing the full potential of digital education initiatives. It ensures coherence, equity, accountability, and innovation in the design, delivery, and evaluation of digital education programs, thereby advancing educational outcomes

and opportunities for learners in the digital age. Education policies provide the framework and guidance necessary for the development, implementation, and evaluation of digital education programs at various levels of the education system. Effective policy implementation ensures that digital education initiatives are aligned with overarching educational goals, standards, and priorities, fostering coherence and synergy across different initiatives and stakeholders. Moreover, robust policy implementation mechanisms facilitate the allocation of resources, coordination of efforts, and monitoring of progress, enhancing accountability and transparency in the execution of digital education initiatives.

Related Research

Digital education initiatives in Yunnan's vocational colleges require enhancement. Studies emphasize their role in formalizing education, training teachers, integrating curriculum and resources. Further research should explore colleges in diverse ethnic and economic regions to tailor initiatives effectively.

Tan (2009, p.3) stated that education is a national priority, and its development requires support from all sectors. With the advent of the information age, various industries have entered the era of cloud computing and big data, and the education industry has also entered the era of information modernization. Cloud computing services, or cloud services, refer to the access to services through the network in an on-demand and easily expandable manner.

Bin and Jie (2012, p.10-14) stated that since the Yunnan government has increased its financial investment in vocational education and also actively broadened its financing channels, the infrastructure construction of the Yunnan vocational colleges has been significantly upgraded. As the conditions for school operation continue to improve, Yunnan vocational colleges have improved the construction of faculty, and the strength of school operation is also being strengthened. Through long-term development, vocational colleges in Yunnan Province have shown a remarkably positive momentum of development and have achieved outstanding results. Meanwhile, there are still a series of problems as follows: Vocational education in Yunnan Province is deeply influenced by traditional ideas, although a number of

individuals still despise the development of vocational education, so the social recognition of vocational colleges has yet to be improved. There is a big gap between the vocational colleges in Yunnan Province and the average level of the country. Yunnan is located in the west, the level of economic development is not high, especially in some border ethnic minority areas, and the level of education is relatively backward, not enough attention to vocational education. While the government has increased its support for vocational education, there are still problems related to insufficient funding, low level of infrastructure construction in vocational colleges, and insufficiently rationalized specialization that need to be solved urgently. Although the vocational colleges are actively exploring various modes of schooling and talent cultivation, the University-Industry Cooperation in Yunnan Province is still in the spontaneous stage, lacking the guidance of macro policies and support.

Siu Cheung Kong et al. (2014, p.70-78) suggested that one of the curricular objectives of e-learning is to develop learners' 21st century skills through everyday learning activities. Key to achieving this curricular goal are research questions and policy implications. A review of the literature in related fields suggests that K-12 schools should use e-learning to maximize learning opportunities for learners to develop 21st century skills. Therefore, six key research questions for e-learning in schooling were identified, namely, achieving the development of 21st century skills in learners; bridging the gap between school curricula and societal contexts; maximizing learning opportunities in the learning process; gathering evidence of improvement and building awareness of progress; assessment of 21st century skills; and providing teacher development to prepare learners to develop 21st century skills. The study recommends that relevant stakeholders in different countries and regions consider policies that set curricular goals for 21st century skills development and bridging the gap between school and society; and the availability of digital technology for school education.

Sharma (2014, p.409-421) argued that economic reforms show that growth is a necessary but not sufficient condition for sustained poverty reduction. Sustained poverty reduction requires opportunity. Opportunities come from the 3Es (education, memorability and employment). The research attempts to explore how privatization

of vocational education affects the quality and scale of vocational skills development in India. The paper proposes practical ideas that will help in developing saleable mechanisms to overcome the current challenges faced by vocational training organizations. The paper also discusses the issues of access, quality, efficiency and value of vocational education in different sectors, with different educational qualifications and for different age groups.

Zhang (2018, p.411-415) suggested that in recent years, how to adapt the construction of higher vocational education specialties in Yunnan to the needs of the rapid development of regional industries is an important issue worth studying. In the face of opportunities and challenges, higher vocational preschool education majors in Yunnan Province should, on the one hand, appropriately control the enrollment scale and gradually meet the market demand within their own capacity; on the other hand, it is necessary to strengthen the integration of school and education and the coordinated development of gardening and learning, to improve the level of professional construction, to ensure the quality of personnel training, and to target the outstanding problems existing in the four aspects of the faculty, the curriculum, the teaching method, and the training of internships.

Xia (2018, p.127) pointed out that the application of intelligent systems in the education sector has become inevitable, and the intelligent education cloud system based on cloud computing services is a typical example of such a system, which enables intelligent, visualized and efficient classroom teaching. Its application is in line with the concept of building a strong education country, and is more in line with the specific requirements of education modernization. Along with the continuous progress of cloud computing, artificial intelligence, big data and other technical means, the service quality of the intelligent education system has also been upgraded, which provides favorable conditions for the safe and effective operation of the system, and also promotes the further development of China's education. In order to further promote the development of education formalization in the new era, the application of information technology must be strengthened so that the concept of academic management can be updated. At present, artificial intelligence, cloud computing, big

data and other technologies have been widely used in various industries, which create conditions for the development of intelligent teaching systems.

Zhang (2018, p.407-412) argued that the ideological condition of vocational college students is associated with ethnic beliefs. This study takes Yunnan vocational colleges as an example to conduct a case study on the current situation of ideological and political etiquette education in higher vocational colleges in ethnic areas, focusing on the use and development of etiquette education, so as to promote the development and innovation of ideological and political education in vocational colleges in Yunnan.

Wen et al. (2019, p.223-237) considered that the vocational education in Yunnan is an important part of Yunnan's higher education. While vocational colleges are developing well, they are also facing serious challenges such as the quality of education and difficulty in meeting the demand of society for talent training. Facing the new era, it is necessary to take a new development path in order to adapt Yunnan's higher vocational education to economic and social needs. This study empirically analyzes the layout, type, specialty and level of 40 higher vocational colleges and universities in Yunnan. Then on the basis of the research results, it systematically discovers the problems existing in the process of their development, and provides scientific interpretation of the connotative development of type function, specialty characteristics, and level structure of Yunnan vocational colleges and universities in the new era. Finally, it proposes applicable measures to promote the connotative development of Yunnan vocational colleges and universities in the new era from the dimensions of government, school and society.

Wu et al. (2014, p.86-94) conducted an in-depth study of the concept of cloud computing, pointing out that the term cloud computing was first introduced in 1988 by John Gage, co-founder of SUN Micro-systems, and has been gradually applied to e-commerce, search engines, etc. In 2009, the analysis of the Horizon Report, jointly published by the US New Media Consortium and EDUCAUSE, predicted that cloud computing would become It will influence the way teachers teach and students learn. The education cloud is an organic combination of cloud computing technology and education, and is the infrastructure of future education information technology,

including all the hardware and computing resources necessary for education information technology, and has great potential for development in education. The education cloud is an in-depth application of cloud computing technology in the field of education, and is the main trend in the future development of education information.

Huang (2020, p.5) emphasized that cloud computing incorporates the products of various computer and network technology developments, integrating various types of servers, storage devices, software, networks and other service resources to form a service model that provides users with a pay-as-you-go service. The education cloud service system, like cloud services, is also an internet service that uses large clusters of servers and storage devices as infrastructure, except that it mainly provides resources related to education. In addition, mapping the structural levels of cloud services to the education sector, three levels of education cloud service systems can be obtained: education cloud infrastructure as a service (E-IaaS), education cloud platform as a service (E-PaaS), and education cloud software as a service (E-SaaS).

Mbanga and Mtembu (2020, p.155-173) identified that TVET lecturers perceived digital learning as conducive to facilitating interaction and discussion between lecturers and learners, easy to use, facilitates and improves teaching and learning and is easy to use. Furthermore, the perception of TVET lecturers indicates that they are ready and willing to apply digital learning in TVET colleges even though the infrastructure and systems of the colleges reflect that they are not yet ready for effective digital learning. TVET lecturers perceive that digital learning is conducive to facilitating interactions and discussions between lecturers and learners, is easy to use, promotes and improves teaching and learning and is easy to use. Furthermore, the perceptions of TVET lecturers indicate that they are ready and willing to apply digital learning in TVET colleges despite the fact that the infrastructure and systems of the colleges reflect that they are not yet ready for effective digital learning.

Berezovska et al. (2020, p.107-118) emphasized the effectiveness and efficiency of education and training in vocational colleges, exploring ways to address and implement the current reform agenda in the field. The study was conducted on the basis of a generalized and comparative approach with the aim of identifying

problems and developments in vocational education. Within the framework of the conducted research, the current state of vocational and higher education is described; the characteristics of online learning at leading universities and its advantages are elucidated; the prospects for the introduction of an educational continuum for the development of personality competencies are examined, taking into account the social changes in the improvement of the vocational and higher education system due to the process of the integration of education in Europe; and an overview of vocational and higher education as a part of the national education system and of the whole of the society is presented directions of development. It is determined that at the present stage the domestic education system should be improved and shifted to innovative ways of development in accordance with the requirements of developed countries. In the near future, modern forms of education, such as distance education, dual education and continuing vocational education, should be improved and integrated into the educational process.

Kuper (2020, p.119-131) suggested that digitization of the work sphere does trigger a process of change, leading to shifts and new combinations of required qualifications. Furthermore, the impact of digitization on qualification requirements is moderated by the organization of work. The study examines which courses can be adapted to the changing requirements of digitization in the new organizational context of Industry 4.0. For the discussion of vocational colleges, it is assumed that technological developments that lead to changes in qualification requirements also increase the potential to meet these requirements.

Veres et al. (2020, p.1-6) argued that from a strategic point of view, digitizing the economy in the near future This means that the focus on digital skills needs to be raised from now on. This is because almost all jobs currently require employees to have some level of digital literacy. Despite the many benefits of digitization, vocational education and training cannot be fully digitized, as qualified professional development must maintain its traditional methods in order to remain efficient and, most importantly, attractive.

Antonietti et al. (2020, p.1-9) identified the acceptance of technology in educational settings as a relevant factor in determining teachers' willingness to use digital tools in their teaching practice. However, the mechanisms of how teachers' digital competence affects or enhances their technology acceptance and willingness to use remain relatively unexplored, especially in vocational colleges. The purpose of this study was twofold: to assess the adaptation of the Technology Acceptance Model (TAM) in a vocational education context and to examine the relationship between teachers' self-assessed beliefs about digital competence and their willingness to accept and use technology in the classroom. Data were collected through a self-administered questionnaire and responses from 2011 vocational teachers were analyzed. Applying structural equation modeling, the results showed that TAM adequately explains teachers' willingness to use digital tools in vocational education; furthermore, there is a positive and significant relationship between teachers' beliefs about digital competence and their beliefs about the ease of use of technology as well as their perceptions of the usefulness of technology in teaching and learning; the latter is positively correlated with willingness to use technology. Understanding the factors that interact with teachers' acceptance of technology and willingness to use it is important for designing teacher training to enhance the successful integration of technology and to promote connectivity between different learning sites in vocational education.

Zhao and Huang (2020, p.7) pointed out that China has invested heavily in the construction of digital teaching resources for vocational education, establishing numerous online courses, teaching resource libraries, and platforms. However, these resources commonly suffer from deficiencies in reflecting the learning patterns of vocational education and low utilization rates. Through a case analysis of digital teaching resource construction in vocational education in Germany, it was found that such construction should be guided by advanced learning theories, creating complete work and learning contexts, and providing learners with various interactive learning support tools.

Khitrova (2021, p.1-5) suggested that the modern system of secondary vocational education requirements for the training of professionals include the active use of digital technologies. The future university graduate must be equipped with

appropriate competencies that will make him competitive on the labor market, able to adapt to professional requirements and navigate the changing information flow. The study considers it necessary to take into account the characteristics of the system of secondary vocational education and to take into account these characteristics. The risks associated with digitalization and its impact on the quality of education in vocational colleges was identified.

Yanli and Danni (2021, p.164-167) argued that the rapid development of digital technology has had a profound impact on the socio-economy and is a distinctive sign that the society has entered the digital era. Digital technology empowers education and at the same time promotes the popularization and promotion of digital education. Against this background, the EU released the 2020 Digitalization Action Plan (2021-2027) at the end of September 2020, pointing out that the integration of digital technology and education is a general trend in the digital era, indicating the development direction and priority actions for the digital transformation of education, and providing policy guidance for the digital transformation of vocational education. Based on the interpretation of the plan proposed by the European Union, through the statistical and comparative analysis of the operating data of vocational education in recent years, it discusses and combines with the digital education plan that it is urgent to form high-quality and inclusive vocational education. Therefore, vocational education in the digital era needs to continuously improve the digital competence of talents and promote the digital transformation of vocational education in order to match the rapidly changing economic structure and the skill needs of the labor market.

Zongmei (2022) proposed research on Yunnan vocational colleges focusing on enrollment marketing. The research is based on practical work, which is conducive to the enrollment of Yunnan vocational colleges, and by improving and optimizing the enrollment marketing strategy, it can improve the quality of student sources, the level of schooling, and the recognition of the school by candidates, parents and society, and also has certain reference significance to the enrollment marketing work of similar institutions.

Gao et al. (2022, p.5) suggests that with the rapid development of information technology, the digitization, informatization, and intelligence needs of teaching, research, administration, logistics, security and other business work of universities are expanding dramatically, which puts forward the upgrading and transformation needs for the timely response capability of IT platform. As a cloud service based on distributed deployment and unified operation and management, Cloud Native is a set of cloud technology product system based on container, microservice, DevOps and other technologies. After using cloud native technology, developers do not need to consider the underlying technical implementation, can give full play to the elasticity of the cloud platform and distributed advantages, to achieve rapid deployment, on-demand scaling, non-stop delivery and so on.

Wang et al. (2022, p.8-13) proposed that with the popularity of the Internet of Things, life is full of data information and data, and the field of education and training is no exception. Web big data is a collection of data that cannot be captured by conventional software tools within a certain timeframe, and is an information asset that requires a new processing paradigm in order to have greater decision-making, insight and process optimization capabilities. This study is an analysis of network big data on the implementation of teacher training policies in vocational colleges and expects to analyses the implementation of teacher training policies in vocational colleges and universities with the support of network big data, and explore the effectiveness of the implementation of the relevant policies, so as to help teachers to improve their professional competence and promote the development of the education industry. The implementation of education strategy in the broad sense refers to the identification, construction and termination of education policies, while education strategy in the narrow sense refers exclusively to education strategies, education setting programmers, education budgets, education plans and so on formulated by education authorities.

Xiuzhen Zeng, & Yaxin Li. (2022, p.23-30) argued that digital transformation has brought unprecedented opportunities and challenges to economic and social development, and the cultivation of digital literacy of talents is increasingly important. Ideally, digitization and digital transformation are three stages of progressive digital

development. However, affected by the differences in microeconomics development between regions, vocational colleges, as the education system closest to the labor market, have differences in their own advantages and digital literacy.

Cheng and Tang (2023, p.829-832) argued that digitization is an extension of the development of informational, and in the digital era, vocational colleges are empowered with artificial intelligence technology. Based on the background of digital development of education and the development trend of higher vocational labour education, the study analyzes the value of AI to labour education, the opportunities and challenges of AI to the development of labour education, explores the path of AI to promote the reform of labour education, and continuously strengthens the awareness, establishes the concepts, fosters the attitudes, safeguards the mechanism, carries out the practices and reflections, and promotes the reform and development of higher vocational labour education.

Deng (2023, p.48-53) argued that digital transformation is a strategic choice for the reform of vocational colleges in the era of digital economy. Specifically, the connotation of digital education in vocational colleges and its important role in promoting the organic integration of industrial chain, innovation chain, education chain and talent chain, builds a dual-wheel drive of digital technology and digital capability, and takes the reconstruction of key scenarios, reconstruction of operation modes and reshaping of value concepts as the transformation Objectives. With business digitization, data value-added and integration normalization as the construction content, digital transformation, digital upgrading and digital good governance as the development stage of the analytical framework, it puts forward the four practical strategies of adhering to the value principle of user orientation, upgrading the level of supply of elements such as digital infrastructure, upgrading the policy guarantee system such as top-level design and promoting the synergistic governance among multiple subjects.

Ye et al. (2023, p.1-18) presented a large number of online courses that have been developed in the global education system to prevent and control the new corona-virus epidemic and to achieve the goal of stopping classes and not stopping schooling. From the perspective of the Sustainable Development Goals (SDGs), these

online programmers should be continued. However, as the epidemic gradually subsides, it remains questionable whether students will still be willing to take these courses. Research on vocational education systems is still limited compared to other related education studies. To expand the understanding of this topic, this study used a snowball sampling method and invited students from vocational colleges in China to fill out a questionnaire to understand the perceived factors that influence students' expectations, attitudes, perceived effectiveness, satisfaction, and persistence in online learning.

Delcker (2023, p.999-1014) proposed that colleges develop the integration of digital competences into the college curriculum. In this study, the occurrence of digital content in 831 courses in German vocational colleges was investigated using text mining methods and contextual keyword analysis. In total, 200 courses containing digital features could be identified. The degree of occurrence of digital terms varies significantly between different types of vocational schools. The distinctive features of digital competence are reflected to varying degrees in the curricula, with a focus on the use of tools for specific vocational tasks and the use of the Internet as an information portal. The ongoing reform of school curricula needs to broaden the vision of digital competences and integrate them more widely into different types of vocational colleges.

Melnyk et al. (2023, p.1-9) believed that digital education initiatives have a significant impact on human capital development. The debate about the advantages and disadvantages of digital education in Ukraine continues until now. The urgency of solving this scientific problem lies in the fact that digital education is crucial for the country's educational policy and the overall development of the country's human capital. The positive impact of digital education initiatives on the development of human capital in Ukraine has been proved theoretically. Educators with skills to work on digital platforms demonstrated better critical thinking and teamwork skills. The results suggest that these initiatives have improved the skills, knowledge and employability of students. The development of digital education also requires the establishment of equitable access to digital educational materials, especially in rural areas, and the qualification of educators to use digital products.

Levin (2024, p.262-274) identified the global impact of online education in the decade since Massive Open Online Courses (MOOCs) were widely advertised in 2012 - exploring learner demographics and preferences, the effectiveness of online learning, the startling and substantial impact on the labor market, and the scalability's impact on reducing the cost of education. The paper concludes that online education has expanded the range of activities undertaken by leading universities and will continue to significantly increase the number of learners with access to low-cost, high-quality education.

In conclusion, digital education initiatives in vocational colleges in Yunnan Province need to be improved at this stage. Related studies point out the important role and specific measures in promoting the digitization of vocational education in Yunnan Province. Positive impacts in education formalization construction, teacher training and professional development, curriculum design and teaching resources integration are emphasized. More in-depth investigations can be conducted to identify vocational colleges in different ethnic areas or areas with different levels of economic development in Yunnan Province, depending on the special geographic location and multiple ethnic groups.

Chapter 3
Research Methodology

This research focuses on improving digital education initiatives in vocational colleges in Yunnan. This research utilizes a multivariate approach and multivariate data collection methods are used for the purpose of checking and determining the correctness of the data. The data of this research is both quantitative and qualitative data. To obtain statistics and raw data, an online questionnaire was conducted with 358 administrators from 8 vocational colleges in Yunnan. In addition, 13 interviews were conducted to collect in-depth information. Furthermore, the data both primary and secondary was used to discourse this study. In other words, the specific data for this study and the secondary data were provided background knowledge. In purpose of serving as a guideline for conducting the study according to the research methodology to achieve the objectives, the researcher developed the following research program.

The first step is to prepare the outline of the research paper. This study collected, organized and studied data, concepts and theories about digital education initiatives. The second step is to analyze the literature review combined with the objective one to set up the questionnaire. This step will form the relevant questionnaire and the instrument that will be used to collect the data from which the data about the current situation will be obtained. Obtain guidelines for improving digital education initiatives to use in setting up assessment forms for facilitation. The final stage was the revision of the proposal based on the changes given by the expert committee for the opening defense. The main purpose the research is studying the current situation and provides guidelines and evaluation guidelines for improving digital education initiatives in vocational colleges in Yunnan.

The researcher has the following procedures.

1. The Population

2. Research Instruments

3. Data Collection

4. Data Analysis

Phase 1: The objective of this phase is to study the level of digital education initiatives in vocational colleges in Yunnan.

The population

The population of this research was 358 administrators from 8 vocational colleges in Yunnan. According to the summary table of the province's administrative division statistics released by the Yunnan Provincial Department of Civil Affairs, as of 2022, Yunnan province governs eight prefecture-level cities. The sample group of this research was 358 administrators from 8 vocational colleges in Yunnan. The eight vocational colleges are composed via one vocational college in each prefecture-level city.

Table 3.1 Lists of Vocational College and Population

No	Vocational colleges in Yunnan	Population
1	T1 Vocational College	55
2	T2 Vocational College	16
3	T3 Vocational College	40
4	T4 Vocational College	31
5	T5 Vocational College	99
6	T6 Vocational College	67
7	T7 Vocational College	20
8	T8 Vocational College	30
Total		**358**

According to table 3.1, it showed that according to the summary table of the province's administrative division statistics released by the Yunnan Provincial Department of Civil Affairs, as of 2022, Yunnan province governs eight prefecture level cities. The population of this research was 358 administrators from 8 vocational colleges in Yunnan. The eight vocational colleges are composed via one vocational college in each prefecture-level city.

The interviewees in this research were 13 high-level administrators with rich experience in education administration. The qualifications of interviewees are as follows: 1) at least 5 years of work experience in high-level administrator in colleges, 2) at least 3 years of work experience in digital education, 3) graduated with master's degree or above.

The experts for evaluation of the adaptability and feasibility of guidelines for improving digital education initiatives in vocational colleges in Yunnan were 13 high-level administrators in Yunnan. The qualifications of the experts are as follows: 1) at least 10 years of work experience in high-level administrator in universities, 2) have extensive experience in digital education, 3) graduated with doctor's degree, 4) academic title is associate professor or above.

Research Instruments

Questionnaire

The instrument to collect the data for objective one, to study the current situation of digital education initiatives in vocational colleges in Yunnan was questionnaire. This research believes that the questionnaire is a platform between researchers and public. The instrument to collect the data for objective one, to study the current situation of digital education initiatives in vocational colleges in Yunnan was questionnaire. The questionnaire designed based on digital education initiatives in four following aspects: 1) digital educational resources, 2) digital technologies, 3) digital transformation of education, 4) digital literacy, 5) financial inputs and 6) effectiveness of education policy implementation. The questionnaire was provided into two parts:

Part 1: Survey about personal information of respondents, classified by gender, age, education background, position and city. The information is in the form of a Check List.

Part 2: Survey about the current situation of digital education initiatives in vocational colleges in Yunnan. There are 12 questions for digital educational resources, 12 questions for digital technologies, 14 questions for digital transformation of education, 11 questions for digital literacy, 11 questions for financial inputs and 11 questions for effectiveness of education policy implementation total 71 questions. The

setup requirement is for respondents to select only one option. The criteria for data interpretation based on five-point Likert's scale, as follows:

5 express the level were at strongly high level

4 express the level were at high level

3 express the level were at medium level

2 express the level were at low level

1 express the level were at low level

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

4.50 – 5.00 refers to the highest level

3.50 – 4.49 refers to high level

2.50 – 3.49 refers to medium level

1.50 – 2.49 refers to low level

1.00 – 1.49 refers to the lowest level

Constructing a questionnaire process

The construction processes of questionnaire were as follows:

Step 1: Reviewing and analyzing documents, concepts, theories, and researches related to digital education initiatives.

Step 2: Constructing the questionnaire about the current situation of digital education initiatives in vocational colleges in Yunnan. Purposive sampling is used to consider the content validity of the questionnaire. Then sending the questionnaire outline of questionnaire to the thesis advisors to review and revise the contents according to the suggestions.

Step 3: The questionnaire was presented to the experts in order to check the quality of the content validity questions. The Item Objective Congruence Index (IOC) is calculated for each question in relation to the operational definition.

Step 4: Revise the questionnaire based on the experts' suggestions. Before further testing, the questions should be improved according to the expert's suggestions.

Step 5: The questionnaire was distributed to 30 administrators in vocational colleges in Yunnan for try-out. And then, it is obtaining the reliability of the questionnaire by Conbach's Alpha Coefficient.

Step 6: The questionnaire was applied to 358 administrators in vocational colleges in Yunnan.

Data Collection

The data collection for objective 1: to study the current situation of to study the current situation of digital education initiatives in vocational colleges in Yunnan, as following procedure:

Step 1: The researcher requested requirement letter form the graduate school, Bansomdejchaopraya Rajabhat University for requiring collecting the data from 358 administrators in vocational colleges in Yunnan

Step 2: The researcher distributed the questionnaire to 358 administrators. A total of 358 questionnaires can be returned, accounting for 100%.

Data Analysis

Before proceeding to analyze the data, the study determines the correctness and completeness of the questionnaire data by checking to be ready to analyze the data. Data files are created to store the variables used in the study and when the data has been prepared, this study follows two steps to analyzing the data, which are initial analysis of the data and analysis to satisfy the purpose of the study. As follows:

Step 1: Preliminary analysis of data is an analysis in order to study the characteristics of each variable data. Preliminary examination to be analyzed to satisfy the statistical data for the purpose of the study, the statistical analysis can be divided into the following two parts, which are the preliminary data analysis of the sample and the basic statistical analysis of the variables with the software, respectively. Initially the data of the sample is analyzed to understand the background of the sample is analyzed and contains the gender, age, education background, position and city of the sample. Then basic statistical analysis is conducted by means of frequencies and percentages. It is the basic statistical analysis of the dependent variable and analyzed to know the mean and standard deviation.

Step 2: The current situation of digital education initiatives in vocational colleges in Yunnan in six following aspects: 1) digital educational resources, 2) digital technologies, 3) digital transformation of education, 4) digital literacy, 5) financial

inputs, and 6) effectiveness of education policy implementation was analyzed by Mean and standard deviation.

Phase 2: The objective of this phase is to formulate the model for the guidelines for improving digital education initiatives in vocational colleges in Yunnan.

Key information

The interviewees in this research were 13 high-level administrators with rich experience in education administration. The qualifications of interviewees are as follows: 1) at least 5 years of work experience in high-level administrator in colleges, 2) at least 3 years of work experience in digital education, 3) graduated with master's degree or above.

Research Instruments

Semi-structured Interview

The instrument collect the data for objective two, which providing the guidelines for improving digital education initiatives in vocational colleges in Yunnan. The semi-structured interview designed based on the current situation of digital education initiatives in vocational colleges in Yunnan in six aspects: 1) digital educational resources, 2) digital technologies, 3) digital transformation of education, 4) digital literacy, 5) financial inputs, and 6) effectiveness of education policy implementation. The interviewees in this research were 13 high-level administrators with rich experience in education administration. Participants can present their ideas in their own words and build a framework in the interview that it is also a core aim of this method. These important statistics were involved to both comparative and thematic analysis. The semi-structured Interview will use email interviews to record information about each interviewee.

The semi-structured interview provide into two parts:

Part 1: the personal information of interviewees, classified by interviewee, education background, work experience, position, and interview date.

Part 2: the questions about suggestion for developing the current situation of digital education initiatives in six aspects: 1) digital educational resources, 2) digital technologies, 3) digital transformation of education, 4) digital literacy, 5) financial

inputs, and 6) effectiveness of education policy implementation, for administrators in in vocational colleges in Yunnan.

Constructing a semi-structured Interview process

The construction processes of semi-structured interview are as follows:

Step 1: Reviewing and analyzing documents, concepts, theories, and researches related to digital education initiatives.

Step 2: Constructing the interview questions about the guidelines for improving digital education initiatives in vocational colleges in Yunnan. The interview questions are designed based on the results of the document survey in six aspects: 1) digital educational resources, 2) digital technologies, 3) digital transformation of education, 4) digital literacy, 5) financial inputs, and 6) effectiveness of education policy implementation. Interview questions should be understandable and easy to answer. Questioning style, word choice, and the scope of the questions should be appropriate to the knowledge level of the interviewee. Then sending the outline of the interview to the thesis advisors to review and revise the contents according to the suggestions.

Data Collection

The data collection for objective 2: to provide guidelines for digital education initiatives in vocational colleges in Yunnan, as following procedured:

Step 1: The researcher requested requirement letter form the graduate school, Bansomdejchaopraya Rajabhat University for requiring collecting the data from 13 high-level administrators.

Step 2: The researcher distributed the interview to 13 high-level administrators. A total of 13 interviews can be returned, accounting for 100%.

Data Analysis

Interview data analysis is served the purpose of the guidelines for improving digital education initiatives in vocational colleges in Yunnan. This step of the analysis was the collection of data from the content analysis, which was obtained from interviews with 13 high-level administrators in vocational colleges in Yunnan.

Phase 3: The objective of this phase is to evaluate the adaptability and feasibility of digital education initiatives in vocational colleges in Yunnan.

Key information

Expert group

The experts for evaluation of the adaptability and feasibility of guidelines for improving digital education initiatives in vocational colleges in Yunnan were 13 high level administrators in Yunnan.

The qualifications of the experts are as follows: 1) at least 10 years of work experience in high-level administrator in universities, 2) have extensive experience in digital education, 3) graduated with doctor's degree, 4) academic title is associate professor or above.

Research Instruments

Evaluation form

The instrument to collect the data for objective three, evaluate the adaptability and feasibility of digital education initiatives in vocational colleges in Yunnan. The data is analyzed to identify the top five interviews, which are then being used to set up an evaluation form for the appropriateness of implementation and to propose guidelines for improving digital education initiatives.

The evaluation form designed based on model for digital education initiatives in vocational colleges in Yunnan in six aspects: 1) digital educational resources, 2) digital technologies, 3) digital transformation of education, 4) digital literacy, 5) financial inputs, and 6) effectiveness of education policy implementation. The evaluation form provide into two parts:

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

Part 2: The evaluation form about the model for improving digital education initiatives in vocational colleges in Yunnan. The criteria for data interpretation based on a five-point Likert's scale, as follows:

5 refers to the adaptability and feasibility of the model at the highest level

4 refers to the adaptability and feasibility of the model at a high level

3 refers to the adaptability and feasibility of the model at a medium level

2 refers to the adaptability and feasibility of the model at a low level

1 refers to the adaptability and feasibility of the model at the lowest level

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

4.50 – 5.00 refers to the highest level

3.50 – 4.49 refers to high level

2.50 – 3.49 refers to medium level

1.50 – 2.49 refers to low level

1.00 – 1.49 refers to the lowest level

Constructing an evaluation form process

The construction processes of evaluation form are as follows:

Step 1: Constructing the evaluation form about improving digital education initiatives in vocational colleges in Yunnan.

Step 2: The evaluation form was applied to 13 high-level administrators in vocational colleges in Yunnan.

Data Collection

The data collection for objective 3: to evaluate the model for improving digital education initiatives in vocational colleges in Yunnan, as following procedured:

Step 1: The researcher requested requirement letter form the graduate school, Bansomdejchaopraya Rajabhat University for requiring to invite the expert to evaluate the model for improving digital education initiatives in vocational colleges in Yunnan.

Step 2: The researcher distributed the evaluation form to high-level administrators. A total of 13 evaluation form.

Data Analysis

The data analysis in this research, the researcher analyzes the data by package program, as follows: The evaluation of the adaptability and feasibility of the model for improving digital education initiatives in vocational colleges in Yunnan is analyzed by Mean and standard deviation.

In conclusion, the personal information of the respondents was analyzed by frequency distribution and percentage. The current situation of digital education

initiatives in vocational colleges in Yunnan was analyzed by Mean and standard deviation. The semi-structured interview about the guidelines improving digital education initiatives in vocational colleges in Yunnan was analyzed by content analysis. The evaluation of the adaptability and feasibility of the guidelines improving digital education initiatives in vocational colleges in Yunnan was analyzed by Mean and standard deviation.

Chapter 4

Data Analysis Results

This research was to study improving digital education initiatives in vocational colleges in Yunnan. The data analysis result can be presented as follows:

1. Symbol and Abbreviations

2. Presentation of Data Analysis

3. Result of Data Analysis

The details are as follows.

Symbol and Abbreviations

n   Refer to sample group.

$\bar{x}$ Refer to mean value.

S.D.   Refer to stand deviation.

Presentation of Data Analysis

The research was to study improving digital education initiatives in vocational colleges in Yunnan. This research utilizes a multivariate approach and multivariate data collection methods are used for the purpose of checking and determining the correctness of the data. It is required 1) to study the current situation of digital education initiatives in vocational colleges in Yunnan, 2) to provide the guidelines for improving digital education initiatives in vocational colleges in Yunnan and 3) to evaluate the adaptability and feasibility of the guidelines improving digital education initiatives in vocational colleges in Yunnan. In accordance with the above, the research results were presented on the following topics:

Part 1: Personal information of respondents.

Part 2: Data analysis of the current situation of digital education initiatives in vocational colleges in Yunnan.

Part 3: Data analysis of semi-structured Interview 13 high-level administrators

Part 4: Data analysis of the results of the comprehensive evaluation of the improving digital education initiatives in vocational colleges.

The details are as follows.

Results of Data Analysis

Part 1: Personal information of respondents, classified by gender, age, education background, position and city

Table 4.1 Number and percentage of respondents

<div align="right">(n = 358)</div>

Basic Information	Type	Sample Size	Percentage
Gender	Male	197	55.03
	Female	161	44.97
	Total	**358**	**100**
Age	20-30 years old	65	18.16
	31-40 years old	161	44.97
	41-50 years old	84	23.46
	Over 50 years old	48	13.41
	Total	**358**	**100**
Academic Background	Bachelor	278	77.65
	Master	56	15.64
	Ph.D	17	4.75
	Below Bachelor Degree	7	1.96
	Total	**358**	**100**
Position	Head of College	12	3.35
	Head of Faculty	25	6.89
	Head of Department	50	13.97
	Administrator	271	75.79
	Total	**358**	**100**

Table 4.1 (Continued)

Basic Information	Type	Sample Size	Percentage
City	Kunming	55	15.36
	Yuxi	16	4.47
	Qujing	40	11.17
	Zhaotong	31	8.66
	Dehong	99	27.65
	Lijiang	67	18.72
	Honghe	20	5.59
	Xishuangbanna	30	8.38
	Total	**358**	**100**

The personal information of respondents, categorized by gender, age, education background, position, and city, is presented in Table 4.1. A total of 358 respondents participated in the survey. Among them, there was a predominance of male respondents, with 197 individuals, accounting for 55.03% of the total. The age group of 31-40 years old was the most represented, comprising 161 respondents, constituting 44.97% of the sample. In terms of educational background, the majority held a bachelor's degree, with 278 respondents, representing 77.65% of the total. Regarding position, administrators constituted the largest group, with 271 individuals, making up 75.79% of the respondents. Geographically, Dehong had the highest representation, with 99 respondents, accounting for 27.65% of the total sample.

Part 2: Data analysis of the current situation of digital education initiatives in vocational colleges in Yunnan

This section comprehensively analyzes the current situation of digital education initiatives in vocational colleges in Yunnan, covering six key aspects, which are digital educational resources, digital technologies, digital transformation of education, digital literacy, financial inputs, and effectiveness of education policy implementation, respectively. As a result of the in-depth study of the six dimensions, the study will focus on the average and standard deviation of the indicators. By calculating the

average, the study is able to obtain the overall level of each aspect. For the standard deviation, it provides the degree of dispersion of the data distribution, which helps to assess the stability and variability of the digital education program in different aspects. This comprehensive analysis method will help to reveal the overall situation of digital education initiatives in Yunnan vocational colleges and provide a scientific basis for developing targeted improvement strategies in the future. By gaining a deeper understanding of the mean and standard deviation of these six aspects, the study will be able to comprehensively assess the implementation status of digital education in Yunnan vocational colleges, and provide important references and guidance for further improving digital education initiatives.

Table 4.2 The average and standard deviation of digital education initiatives in vocational colleges in Yunnan in six aspects

(n=358)

No	Digital education initiatives in vocational colleges in Yunnan	$\bar{x}$	S.D.	Level	Order
1	Digital educational resources	3.93	1.13	High	5
2	Digital technologies	3.92	1.13	High	6
3	Digital transformation of education	3.95	1.13	High	2
4	Digital literacy	3.94	1.12	High	3
5	Financial inputs	3.94	1.12	High	3
6	Effectiveness of education policy implementation	3.96	1.14	High	1
	Total	3.94	1.13	High	

Table 4.2 presents the average and standard deviation of digital education initiatives in vocational colleges in Yunnan across six aspects. The aspect with the highest average score is the effectiveness of education policy implementation, with a mean value of 3.97 and a standard deviation of 1.14. Following closely is digital transformation of education, which obtained the second-highest average score of 3.95, with a standard deviation of 1.13. Conversely, digital technologies received the lowest average score, with a mean value of 3.92 and a standard deviation of 1.13.

Table 4.3 Analysis result of digital educational resources

No	Digital educational resources	$\bar{x}$	S.D.	Level	Order
1	Administrators expect to have access to a wide range and better quality of digital education resources.	4.02	1.12	High	1
2	Administrators think there is a high degree of integration and sharing of educational resources in digital education.	4.01	1.05	High	2
3	Administrators think that digital educational resources could meet the needs of the Digital Education Initiative (DEI).	3.89	1.11	High	9
4	Administrators agree that wired network covers public places such as teaching, activities and offices.	3.88	1.18	High	10
5	Administrators agree that wireless network covers public places such as teaching, activities and offices.	3.96	1.14	High	4
6	Administrators agree that college's educational digital resources (digitized teaching and learning materials, course content, digital teaching platform, etc.) can be fully utilized.	3.91	1.13	High	7
7	Administrators agree that public spaces are equipped with appropriate public terminals (e.g., large-screen TVs, touch-screen computers, etc.).	3.88	1.21	High	11

Table 4.3 (Continued)

	Digital educational resources	$\bar{x}$	S.D.	Level	Order
8	Administrators agree that lecture halls, conference rooms, libraries and other functional classrooms are equipped with networked multimedia devices.	3.97	1.08	High	3
9	Administrators agree that the college's digital infrastructure is complete, the digital resources and environment construction covers a wide range, and the application level is high.	3.95	1.17	High	5
10	Administrators agree that the college provides data and information that can reflect the overall situation, and can make full use of the data to provide services for teaching and scientific research.	3.93	1.14	High	6
11	Administrators agree that the college provides data and information that can reflect the overall situation, and can make full use of the data to provide services for management and decision-making.	3.91	1.11	High	8
12	Administrators agree that college establishes a resource-sharing mechanism to achieve the common construction and sharing of high-quality digital educational resources, and to improve the circulation rate and utilization rate of resources.	3.87	1.15	High	12
	Total	**3.93**	**1.13**	**High**	

According to the table 4.3, here is an in-depth analysis of the variables based on their average values, standard deviations, levels, and orderings. Administrators express high expectations for access to a wide range and better quality of digital education resources, ordering it the highest among the assessed variables ($\bar{x}$=4.02). The relatively low standard deviation indicates a consensus among administrators on the importance of this aspect. The perceived degree of integration and sharing of educational resources in digital education is also rated high, with a slightly lower average value compared to the first variable ($\bar{x}$=4.01). Conversely, administrators' agreement on the establishment of a resource-sharing mechanism received the lowest average score, with a mean value of 3.87 and a standard deviation of 1.15.

Table 4.4 Analysis result of digital technologies

(n=358)

No	Digital technologies	$\bar{x}$	S.D.	Level	Order
1	Administrators agree that vocational college has a high prevalence of digital technologies use.	3.93	1.12	High	6
2	Administrators agree that vocational college is highly networked.	3.84	1.21	High	12
3	Administrators agree that vocational college has a high degree of sharing of network resources.	3.91	1.09	High	7
4	Administrators agree that vocational college has a high level of application of intelligent technology.	3.96	1.14	High	5
5	Administrators agree that vocational college has a high level of access to and use of intelligent applications in research.	3.97	1.09	High	3

Table 4.4 (Continued)

No	Digital technologies	$\bar{x}$	S.D.	Level	Order
6	Administrators agree that vocational college has a wide range of applications to meet the needs of teaching and learning and other digital applications, and to support group access during peak periods.	3.90	1.14	High	8
7	Administrators agree that college is able to apply all levels of platforms to implement digital management of academic affairs, administrative affairs, college conditions and teaching equipment.	4.03	1.08	High	1
8	Administrators agree that college prioritizes the use of national, provincial, municipal, and county IT application platforms.	3.87	1.12	High	11
9	Administrators agree that college has a digital publicity platform to realize digital communication with students, parents, and the community.	3.98	1.08	High	2
10	Administrators agree that college can realize data integration and sharing between various application systems within the college, effectively solving the problem of data silos.	3.88	1.16	High	10

Table 4.4 (Continued)

No	Digital technologies	$\bar{x}$	S.D.	Level	Order
10	Administrators agree that college can realize data integration and sharing between various application systems within the college, effectively solving the problem of data silos.	3.88	1.16	High	10
11	Administrators agree that college is able to realize the connection of personnel, data, applications, and software and hardware resources by combining the education network, campus network, and Internet of Things on campus.	3.89	1.20	High	9
12	Administrators agree that the college can use intelligent technology to collect, monitor and analyze educational data.	3.96	1.10	High	4
	Total	**3.92**	**1.13**	**High**	

According to the table4.4, the college was able to apply all levels of the platform to implement digital management ($\bar{x}$= 4.03) which was the highest. This shows recognition of the college's ability to manage digitally. The relatively low standard deviation of 1.08 indicates a consensus among administrators. The second highest agreement with an average value of 3.98 focuses on the presence of a digital publicity platform for communication with students, parents, and the community. However, the lowest average value is related to administrators' agreement on the vocational college being highly networked ($\bar{x}$= 3.84). The higher standard deviation of 1.21 indicates a more varied perception among administrators.

Table 4.5 Analysis result of digital transformation of education

(n=358)

No	Digital transformation of education	$\bar{x}$	S.D.	Level	Order
1	Administrators agree that the college has a reasonable digital leadership organization, rigorous digital planning and system (policy planning, financial investment, professional training, etc.).	3.97	1.09	High	4
2	Administrators agree that college has formulated a clear vision of the goals of education digital transformation, practice areas, technology application routes and strategies.	3.92	1.15	High	12
3	Administrators agree that college needs to introduce a systematic guidance program for education digital transformation, formulate a digital management system, and have a unified digital management platform that can ensure standardized processes, timely processing, and long-term storage.	3.91	1.21	High	14
4	Administrators agree that college has a strong digital education atmosphere.	3.97	1.07	High	5
5	Administrators agree that college has a digital management platform.	3.95	1.12	High	8
6	Administrators agree that college can realize digital transformation and intelligent upgrading of teaching and learning, and support teachers and students to carry out independent learning, collaborative learning and inquiry learning, as well as personalized tutoring.	3.97	1.09	High	6

Table 4.5 (continued)

	Digital transformation of education	$\bar{x}$	S.D.	Level	Order
7	Administrators agree that the administrators understand the development trend of education digital and the guidelines and policies on digital development of education departments at all levels.	3.94	1.16	High	10
8	Administrators agree that administrators are able to plan, design, implement and improve the college's digital environment.	3.95	1.16	High	9
9	Administrators agree that the college has established a digitalization policy, with policies and strategic plans focusing on emerging technologies such as artificial intelligence.	3.92	1.14	High	13
10	Administrators agree that the college is equipped with a combination of specialized and part-time professional staff with reasonable structure and excellent quality in digital campus construction and application, and effectively carries out the daily operation and maintenance of campus digital hardware and software equipment as well as the development of innovative applications.	3.94	1.18	High	11
11	Administrators agree that the college has developed a master plan and planning for the construction of the digital campus and applied to the higher authorities for review and filing.	3.96	1.19	High	7

Table 4.5 (Continued)

	Digital transformation of education	$\bar{x}$	S.D.	Level	Order
12	Administrators agree that the college has developed a phased implementation programmer for the construction of a digital campus in accordance with the overall plan, which has been validated by relevant experts.	4.00	1.03	High	1
13	Administrators agree that the college has established sound rules and regulations for the construction, application and management of the digital campus (including campus network, terminal implementation, application platform, application incentives, talent training, information security, etc.)	3.99	1.12	High	3
14	Administrators agree that the college already maintains a digital in education system and has established a digital build/reform leadership group for designing digital transformation programmers and assessing their feasibility.	4.00	1.13	High	2
	Total	**3.95**	**1.13**	**High**	

According to the table4.5, the highest average value indicates administrators strong agreement regarding the college's development of a phased implementation program for the digital campus ($\bar{x}$= 4). The low standard deviation of 1.03 suggests a high level of consensus among administrators. The second variable with the same high average value of 4 signifies administrators' unanimous agreement that the college maintains a digital in education system. The standard deviation of 1.13, while slightly higher, still indicates a considerable level of consensus. The lowest average value revolves around administrators' agreement on the need for a systematic guidance program for education digital transformation ($\bar{x}$= 4). The higher standard deviation of 1.21 suggests a more varied perception among administrators.

Table 4.6 Analysis result of digital literacy

<div align="right">(n=358)</div>

No	Digital literacy	$\bar{x}$	S.D.	Level	Order
1	Administrators agree that college emphasizes the development of digital competence.	3.90	1.15	High	11
2	Administrators agree that college offers a full range of information technology (IT) courses.	3.94	1.15	High	5
3	Administrators agree that staff can participate in various IT exchange activities at all levels.	3.99	1.14	High	2
4	Administrators agree that college has established a comprehensive training and upgrading system for information technology application skills.	3.91	1.17	High	10
5	Administrators agree that the college's established system for training and improving skills in the use of information technology has been implemented effectively.	3.97	1.03	High	4
6	Administrators agree that managers can correctly understand the value and role of information technology in the work of the college and the department.	4.00	1.12	High	1
7	Administrators agreed that specific measures were in place to support and incentive IT faculty research in a variety of management system building areas.	3.98	1.12	High	3
8	Administrators agreed that specific measures were in place that could support and incentive IT faculty to conduct research on teaching and learning.	3.93	1.14	High	7

Table 4.6 (Continued)

	Digital literacy	$\bar{x}$	S.D.	Level	Order
9	Administrators agree on the ability to influence all faculties and staff to work together to achieve the vision of advancing the educational transformation of the college.	3.94	1.12	High	6
10	Administrators agreed that in moving forward with the educational transformation of the college, administrators were able to plan and build a vision for information technology development.	3.92	1.14	High	9
11	Administrators agree that administrators lead all teachers to improve their IT application skills, actively participate in information technology leadership training, and regularly carry out training on the construction and application of digital education to improve the digital literacy of the teaching staff.	3.93	1.11	High	8
	Total	**3.94**	**1.12**	**High**	

According to the table4.6, the highest average value, 4, indicates administrators strong agreement that managers can correctly understand the value and role of information technology in the college and department's work. The low standard deviation of 1.12 suggests a high level of consensus among administrators ($\bar{x}$= 4). The second high average value of 3.99 signifies administrators' agreement that staff can actively participate in various IT exchange activities at all levels. The standard deviation of 1.14, while slightly higher, still indicates a considerable level of consensus. Emphasis on development of digital competence was the lowest average value ($\bar{x}$= 3.9), revolves around administrators' agreement on the emphasis placed on the development of digital competence within the college. The higher standard deviation of 1.15 suggests a more varied perception among administrators.

Table 4.7 Analysis result of financial inputs

(n=358)

No	Financial inputs	$\bar{x}$	S.D.	Level	Order
1	Administrators think college has enough financial investment in digital education.	3.93	1.11	High	9
2	Administrators think the funding investment meets the needs of the digital education initiative.	3.94	1.18	High	5
3	Administrators think the college has a clear budget planning and management mechanism regarding financial commitment.	3.88	1.14	High	11
4	Administrators think that the financial investment can cover all aspects of the digital education initiative.	3.93	1.09	High	8
5	Administrators think college has a dedicated funding source to support digital education initiatives.	3.89	1.14	High	10
6	Administrators think college has a transparent and fair decision-making in terms of funding.	3.99	1.08	High	3
7	Administrators think college has a transparent and fair approval process in terms of funding.	4.00	1.07	High	2
8	Administrators think the funding investment could meet the expansion needs of the digital education initiative.	3.94	1.15	High	6
9	Administrators think the funding investment could meet the development needs of the digital education initiative.	3.94	1.15	High	7
10	Administrators believe that focusing on funding is important for colleges' digital education initiative.	3.98	1.11	High	4

Table 4.7 (Continued)

No	Financial inputs	$\bar{x}$	S.D.	Level	Order
11	Administrators think financial inputs for digital education in colleges are positive for achieving the Sustainable Development Goals (SDGs).	4.03	1.11	High	1
	Total	3.94	1.12	High	

According to the table4.7, the analysis of the financial inputs within the context of enhancing digital education initiatives in Yunnan's vocational colleges provides valuable insights into administrators' perspectives on the financial aspects crucial for sustainable development and transparency. The highest average value was 4.03, underscores administrators' strong agreement that financial inputs for digital education positively contribute to achieving the SDGs. The relatively low standard deviation of 1.11 indicates a significant level of consensus among administrators. The second high average value was transparent and fair funding approval process ($\bar{x}$= 4). The standard deviation of 1.07, while slightly higher, still indicates a considerable level of consensus. The lowest average value was 3.88, revolves around administrators' perceptions of financial inputs for digital education. The higher standard deviation of 1.14 suggests a more varied perception among administrators.

Table 4.8 Analysis result of effectiveness of education policy implementation

(n=358)

No	Effectiveness of education policy implementation	$\bar{x}$	S.D.	Level	Order
1	Administrators think education policy implementation can meet the needs of digital education initiatives.	3.98	1.15	High	3
2	Administrators think that education policy implementation can provide clear guidance.	4.04	1.09	High	1
3	Administrators think that education policy implementation can provide support.	3.94	1.14	High	7
4	Administrators think college has effective education policy advocacy.	3.94	1.14	High	8
5	Administrators think college has effective education policy outreach mechanisms.	3.99	1.14	High	2
6	Administrators think that the college has effective feedback in the implementation policies.	3.93	1.16	High	9
7	Administrators think that the college has evaluation mechanisms in the implementation of education policies.	3.98	1.09	High	4
8	Administrators think college has a dedicated policy enforcement agency or team.	3.92	1.17	High	10
9	Administrators think that college education policy implementation provides opportunities for continuous improvement and optimization.	3.98	1.16	High	5
10	Administrators think that college has clear criteria and indicators for evaluating the effectiveness of the implementation of education policy.	3.95	1.09	High	6
11	Administrators think that digital education initiatives are resourced and supported by policy implementation.	3.90	1.19	High	11
	Total	**3.96**	**1.14**	**High**	

According to the table 4.8, it sheds light on administrators' perspectives regarding the successful execution of education policies in the context of advancing digital education initiatives in Yunnan's vocational colleges. The highest average value was 4.04. The relatively low standard deviation of 1.09 suggests a high level of consensus among administrators. The second high average value of 3.99 signifies administrators' agreement that the college has effective education policy outreach mechanisms. The standard deviation of 1.14, while slightly higher, still indicates a considerable level of consensus. The lowest average value revolves around administrators' perceptions of whether digital education initiatives are adequately resourced and supported by policy implementation ($\bar{x}$= 3.9). The higher standard deviation of 1.19 suggests a more varied perception among administrators.

Part 3: Data analysis of semi-structured Interview 13 high-level administrators

Table 4.9 Personal information of interviewee

(n = 13)

Interviewee	Background	Interview Date
Interviewee 1	**Education:** Master's degree **Position:** Head of Vocational College **Work experience:**33 years	Feb. 2, 2024
Interviewee 2	**Education:** Doctor's degree **Position:** Head of Section **Work experience:**16 years	Jan. 29, 2024
Interviewee 3	**Education:** Master's degree **Position:** Head of Vocational College **Work experience:**35 years	Jan. 30, 2024
Interviewee 4	**Education:** Master's degree **Position:** Head of Section **Work experience:**18 years	Jan. 29, 2024
Interviewee 5	**Education:** Doctor's degree **Position:** Director of Department **Work experience:**19 years	Jan. 30, 2024
Interviewee 6	**Education:** Master's degree **Position:** Director of Department **Work experience:**26 years	Jan. 31, 2024
Interviewee 7	**Education:** Master's degree **Position:** Head of Section **Work experience:**15 years	Feb. 1, 2024
Interviewee 8	**Education:** Doctor's degree **Position:** Head of Section **Work experience:**18 years	Jan. 29, 2024

Table 4.9 (Continued)

(n = 13)

Interviewee	Background	Interview Date
Interviewee 9	**Education:** Master's degree **Position:** Head of Administration **Work experience:**25 years	Jan. 30, 2024
Interviewee10	**Education:** Master's degree **Position:** Director of Department **Work experience:**16 years	Feb. 2, 2024
Interviewee11	**Education:** Master's degree **Position:** Head of Section **Work experience:**15 years	Jan. 29, 2024
Interviewee11	**Education:** Master's degree **Position:** Director of Department **Work experience:**20 years	Feb. 3, 2024
Interviewee12	**Education:** Master's degree **Position:** Head of Administration **Work experience:**33 years	Jan. 31, 2024
Interviewee13	**Education:** Doctor's degree **Position:** Director of Department **Work experience:**26 years	Jan. 31, 2024

During the period from January 29th to February 3rd, 2024, semi-structured interviews were conducted via email with 13 high-level administrators. The purpose of these interviews was to gather insights into the current state of digital education initiatives in vocational colleges in Yunnan. Six key questions were asked during the interviews, focusing on various aspects of digital education initiatives. These questions aimed to explore the administrators' perspectives on the challenges, opportunities, and best practices related to digital education in vocational colleges. Through the data analysis process, a total of 37 guidelines were collected and categorized. These guidelines encompassed a wide range of topics, including collaboration with industry

partners, investment in digital content creation, upgrading network infrastructure, establishing systematic guidance programs, emphasizing digital literacy, advocating for increased financial support, and promoting collaborative approaches to policy implementation. The data analysis revealed common themes and patterns across the responses, providing valuable insights into the strategies and recommendations for improving digital education initiatives in vocational colleges in Yunnan.

Table 4.10 The guidelines for improving digital education initiatives in vocational colleges in Yunnan

Contents	Guidelines
To improve the current digital educational resources to better meet the needs of the digital education Initiative	1. Increase the introduction of resources 2. Enhance teacher training and education literacy 3. Expanding digital teaching scenarios 4. Strengthen cooperation with industry 5. Focus on student participation and feedback 6. Continuous evaluation and improvement
To improve the integration and utilization of digital technologies through enhancements in the college's networking infrastructure	1. Enhance network bandwidth and coverage 2. Optimize network equipment and facilities 3. Construction of digital campus 4. Provide diversified network services 5. Continuously monitor and optimize network operation
To improve the establishment of a systematic guidance program and a unified digital management platform for education transformation, as perceived by administrators	1. Formulate a clear plan for education transformation 2. Establishment of cross-departmental collaboration mechanism 3. Introduce advanced digital management tools 4. Enhance teacher training and support 5. Establish a data statistics and analysis platform 6. Strengthen the monitoring and evaluation mechanism

Table 4.10 (Continued)

Contents	Guidelines
To improve the implementation of initiatives that emphasize and foster digital competence among staff and students in the realm of digital literacy	1. Conduct systematic digital literacy training 2. Establish a digital learning platform 3. Promote digital teaching modes 4. Establish digital learning community 5. Strengthen the practice and application links Establishment of evaluation system and incentive mechanism
To improve the addressing of factors contributing to administrators' perceptions that financial inputs for digital education are insufficiently supporting initiatives	1. Formulate a financial expenditure plan for digital education 2. Optimize the allocation of financial resources 3. Expanding external funding channels 4. Establish evaluation mechanism for digital education projects 5. Enhance financial transparency and openness 6. Promote internal resource sharing and collaboration Establish long-term planning and sustainable development mechanism
To improve the overall effectiveness of digital education initiatives by enhancing the alignment of policy resources and support within the college's education policy implementation	1. Formulate a clear digital education policy 2. Strengthen policy publicity and training 3. Establishment of a monitoring mechanism for the implementation of the policy 4. Promote interdepartmental collaboration and communication 5. Strengthen data analysis and evaluation 6. Establish feedback mechanism and advocate opinion exchange 7. Strengthen the connection with external partners

According to Figure 4.10, this research proposed the purpose guidelines for improving digital education initiatives in vocational colleges in Yunnan was six aspects, which contain 37guidlines. Specifically, there are six measures to improve the current digital educational resources to better meet the needs of the digital education Initiative. There are five measures to improve the integration and utilization of digital technologies through enhancements in the college's networking infrastructure. There are six measures to improve the establishment of a systematic guidance program and a unified digital management platform for education transformation, as perceived by administrators. There are six measures to improve the implementation of initiatives that emphasize and foster digital competence among staff and students in the realm of digital literacy. There are seven measures to improve the addressing of factors contributing to administrators' perceptions that financial inputs for digital education are insufficiently supporting initiatives. There are seven measures to improve the overall effectiveness of digital education initiatives by enhancing the alignment of policy resources and support within the college's education policy implementation. The framework of the guidelines is as follows:
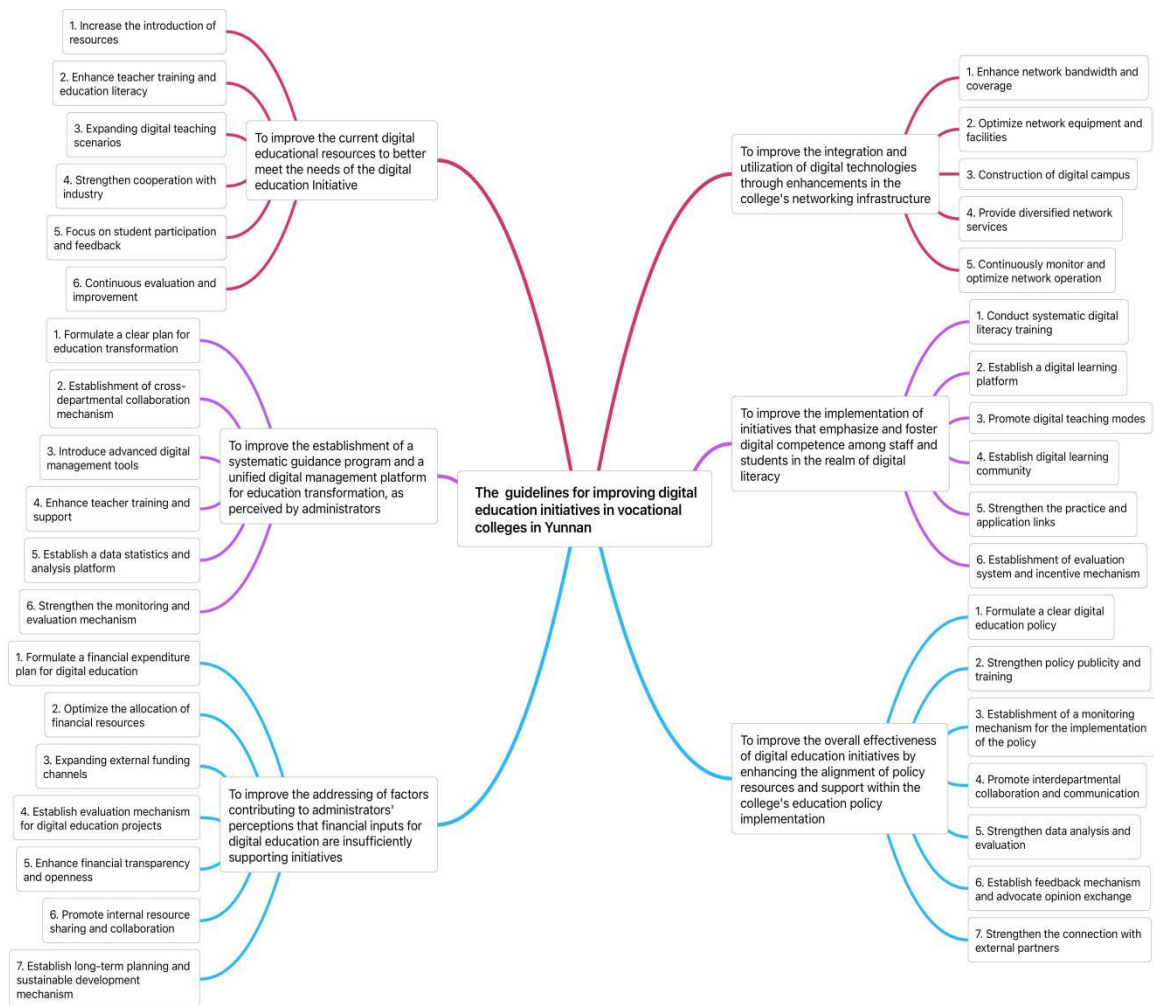
Figure 4.1 The purpose guidelines for improving digital education initiatives in vocational colleges in Yunnan

Part 4: Data analysis of the results of the comprehensive evaluation of the improving digital education initiatives in vocational colleges in Yunnan

Table 4.11 The average value and standard deviation of the evaluation of the suitability and feasibility of the purpose guidelines in digital educational resources

No	The guidelines for improving digital education initiatives in vocational colleges in Yunnan	Adaptability			Feasibility		
		$\bar{x}$	S.D.	level	$\bar{x}$	S.D.	level
To improve the current digital educational resources to better meet the needs of the digital education Initiative							
1	Increase the introduction of resources	4.29	0.75	high	4.43	0.78	high
2	Enhance teacher training and education literacy	4.43	0.78	high	4.57	0.53	highest
3	Expanding digital teaching scenarios	4.57	0.78	highest	4.57	0.53	high
4	Strengthen cooperation with industry	4.14	0.69	high	4.71	0.48	highest
5	Focus on student participation and feedback	4.14	0.69	high	4.29	0.48	high
6	Continuous evaluation and improvement	4.43	0.78	high	4.14	0.69	high
	Total	4.33	0.75	high	4.45	0.58	high

According to Table 4.11, found that the suitability and feasibility of guidelines for improving digital education initiatives in vocational colleges in Yunnan in digital educational resources was at the high level with values between 4.33 and 4.45, which means guidelines for improving the current digital educational resources to better meet the needs of the digital education Initiative is suitability and feasibility.

Table 4.12 The average value and standard deviation of the evaluation of the suitability
and feasibility of the purpose guidelines in digital technologies

No	The guidelines for improving digital education initiatives in vocational colleges in Yunnan	Adaptability			Feasibility		
		$\bar{x}$	S.D.	level	$\bar{x}$	S.D.	level
To improve the integration and utilization of digital technologies through enhancements in the college's networking infrastructure							
1	Enhance network bandwidth and coverage	4.14	0.69	high	4.43	0.53	high
2	Optimize network equipment and facilities	4.71	0.48	highest	4.29	0.48	high
3	Construction of digital campus	4.29	0.75	high	4.57	0.78	highest
4	Provide diversified network services	4.14	0.37	high	4.57	0.54	highest
5	Continuously monitor and optimize network operation	4.43	0.78	high	4.57	0.53	highest
	Total	4.34	0.61	high	4.48	0.57	high

According to Table 4.12, found that the suitability and feasibility of
guidelines for improving digital education initiatives in vocational colleges in Yunnan
in digital technologies was at the high level with values between 4.34 and 4.48, which
means guidelines for improving the integration and utilization of digital technologies
through enhancements in the college's networking infrastructure is suitability and
feasibility.

Table 4.13 The average value and standard deviation of the evaluation of the suitability and feasibility of the purpose guidelines in digital transformation of education

No	The guidelines for improving digital education initiatives in vocational colleges in Yunnan	Adaptability			Feasibility		
		$\bar{x}$	S.D.	level	$\bar{x}$	S.D.	level
To improve the establishment of a systematic guidance program and a unified digital management platform for education transformation, as perceived by administrators							
1	Formulate a clear plan for education transformation	4.14	0.69	high	4.29	0.48	high
2	Establishment of cross-departmental collaboration mechanism	4.43	0.53	high	4.00	0.81	high
3	Introduce advanced digital management tools	4.14	0.69	high	4.29	0.48	high
4	Enhance teacher training and support	4.43	0.53	high	4.43	0.78	high
5	Establish a data statistics and analysis platform	4.23	0.63	high	4.39	0.57	high
6	Strengthen the monitoring and evaluation mechanism	4.14	0.90	high	4.14	0.69	high
	Total	4.25	0.66	high	4.26	0.64	high

According to Table 4.13, found that the suitability and feasibility of guidelines for improving digital education initiatives in vocational colleges in Yunnan in digital transformation of education was at the high level with values between 4.25 and 4.26, which means guidelines for improving the establishment of a systematic guidance program and a unified digital management platform for education transformation, as perceived by administrators is suitability and feasibility.

Table 4.14 The average value and standard deviation of the evaluation of the suitability and feasibility of the purpose guidelines in digital literacy

No	The guidelines for improving digital education initiatives in vocational colleges in Yunnan	Adaptability			Feasibility		
		$\bar{x}$	S.D.	level	$\bar{x}$	S.D.	level
To improve the implementation of initiatives that emphasizes and fosters digital competence among staff and students in the realm of digital literacy							
1	Conduct systematic digital literacy training	4.71	0.48	highest	4.29	0.75	high
2	Establish a digital learning platform	4.43	0.53	highest	4.14	0.69	high
3	Promote digital teaching modes	3.71	0.75	highest	4.71	0.48	highest
4	Establish digital learning community	3.71	0.75	highest	4.43	0.53	high
5	Strengthen the practice and application links	4.14	0.69	high	4.71	0.48	highest
6	Establishment of evaluation system and incentive mechanism	4.57	0.78	highest	4.29	0.95	high
	Total	4.21	0.66	high	4.23	0.65	high

According to Table 4.14, found that the suitability and feasibility of guidelines for improving digital education initiatives in vocational colleges in Yunnan in digital literacy was at the high level with values between 4.21 and 4.23, which means guidelines for improving the implementation of initiatives that emphasizes and fosters digital competence among staff and students in the realm of digital literacy is suitability and feasibility.

Table 4.15 The average value and standard deviation of the evaluation of the suitability and feasibility of the purpose guidelines in financial inputs

No	The guidelines for improving digital education initiatives in vocational colleges in Yunnan	Adaptability			Feasibility		
		$\bar{x}$	S.D.	level	$\bar{x}$	S.D.	level
To improve the addressing of factors contributing to administrators' perceptions that financial inputs for digital education are insufficiently supporting initiatives							
1	Formulate a financial expenditure plan for digital education	4.14	0.69	high	4.43	0.53	high
2	Optimize the allocation of financial resources	4.14	0.69	high	4.71	0.48	high
3	Expanding external funding channels	4.00	0.81	high	4.29	0.76	high
4	Establish evaluation mechanism for digital education projects	4.29	0.48	high	4.43	0.78	high
5	Enhance financial transparency and openness	4.14	0.69	high	4.43	0.78	high
6	Promote internal resource sharing and collaboration	4.43	0.78	high	4.43	0.53	high
7	Establish long-term planning and sustainable development mechanism	4.14	0.90	high	4.14	0.69	high
	Total	4.18	0.72	high	4.41	0.65	high

According to Table 4.15, found that the suitability and feasibility of guidelines for improving digital education initiatives in vocational colleges in Yunnan in financial inputs was at the high level with values between 4.18 and 4.41, which means guidelines for improving the addressing of factors contributing to administrators' perceptions that financial inputs for digital education are insufficiently supporting initiatives is suitability and feasibility.

Table 4.16 The average value and standard deviation of the evaluation of the suitability and feasibility of the purpose guidelines in education policy implementation

No	The guidelines for improving digital education initiatives in vocational colleges in Yunnan	Adaptability			Feasibility		
		$\bar{x}$	S.D.	level	$\bar{x}$	S.D.	level
To improve the overall effectiveness of digital education initiatives by enhancing the alignment of policy resources and support within the college's education policy implementation							
1	Formulate a clear digital education policy	4.14	0.69	high	4.43	0.53	high
2	Strengthen policy publicity and training	4.29	0.48	high	4.29	0.95	high
3	Establishment of a monitoring mechanism for the implementation of the policy	4.00	0.81	high	4.29	0.76	high
4	Promote interdepartmental collaboration and communication	4.29	0.48	high	4.43	0.78	high
5	Strengthen data analysis and evaluation	4.14	0.69	high	4.43	0.78	high

Table 4.16 (Continued)

No	The guidelines for improving digital education initiatives in vocational colleges in Yunnan	Adaptability			Feasibility		
		$\bar{x}$	S.D.	level	$\bar{x}$	S.D.	level
6	Establish feedback mechanism and advocate opinion exchange	4.43	0.78	high	4.43	0.53	high
7	Strengthen the connection with external partners	4.14	0.90	high	4.29	0.75	high
	Total	4.20	0.69	high	4.37	0.73	high

According to Table 4.16, found that the suitability and feasibility of guidelines for improving digital education initiatives in vocational colleges in Yunnan in education policy implementation was at the high level with values between 4.18 and 4.41, which means guidelines for improving the overall effectiveness of digital education initiatives by enhancing the alignment of policy resources and support within the college's education policy implementation is suitability and feasibility.

Chapter 5

Conclusion Discussion and Recommendations

The research is the guidelines for improving digital education initiatives in vocational colleges in Yunnan. The objectives of this research were 1) to study the current situation of digital education initiatives in vocational colleges in Yunnan, 2) to provide the guidelines for improving digital education initiatives in vocational colleges in Yunnan and 3) to evaluate the adaptability and feasibility of the guidelines improving digital education initiatives in vocational colleges in Yunnan were including 6 following aspects which are digital educational resources, digital technologies, digital transformation of education, digital literacy, financial inputs, and effectiveness of education policy implementation, respectively. The population in this study consists of 358 respondents from 8 vocational colleges in Yunnan Province. The Interview group was 13 high-level administrators. The research instruments were documents analysis, questionnaire, and interview. The statistic to analyze the data was percentage, average value, and standard deviation.

The details are as follows.

Conclusion

The research is the guidelines for improving digital education initiatives in vocational colleges in Yunnan. The researcher summarizes the conclusion into 3 parts, details as follows:

Part 1: The level of digital education initiatives in vocational colleges in Yunnan.

Part 2: The guidelines for improving digital education initiatives in vocational colleges in Yunnan.

Part 3: The adaptability and feasibility of the guidelines improving digital education initiatives in vocational colleges in Yunnan.

Part 1: The level of digital education initiatives in vocational colleges in Yunnan

Research found that the current situation of digital education initiatives in vocational colleges in Yunnan were at high level in six aspects. Based on the research results, six aspects involved were ranged from the high to low were: effectiveness of education policy implementation, digital transformation of education, digital literacy, financial inputs, digital educational resources and digital technologies.

1. Digital educational resources was at high level. Considering the results of this research aspects ranged from the highest to lowest level were as follow: the highest level was administrators express high expectations for access to a wide range and better quality of digital education resources, followed by administrators think there is a high degree of integration and sharing of educational resources in digital education, and administrators' agreement on the establishment of a resource-sharing mechanism was the lowest level.

2. Digital technologies was at high level. Considering the results of this research aspects ranged from the highest to lowest level were as follow: the highest level was the college was able to apply all levels of the platform to implement digital management, followed by the presence of a digital publicity platform for communication with students, parents, and the community, and administrators' agreement on the vocational college being highly networked was the lowest level.

3. Digital transformation of education was at high level. Considering the results of this research aspects ranged from the highest to lowest level were as follow: the highest level was administrators' strong agreement regarding the college's development of a phased implementation program for the digital campus, followed by administrators' unanimous agreement that the college maintains a digital in education system, and administrators' agreement on the need for a systematic guidance program for education digital transformation was the lowest level.

4. Digital literacy was at high level. Considering the results of this research aspects ranged from the highest to lowest level were as follow: the highest level was administrators' strong agreement that managers can correctly understand the value and role of information technology in the college and department's work, followed

by administrators' agreement that staff can actively participate in various IT exchange activities at all levels, and emphasis on development of digital competence was the lowest level.

5. Financial inputs was at high level. Considering the results of this research aspects ranged from the highest to lowest level were as follow: the highest level was administrators' strong agreement that financial inputs for digital education positively contribute to achieving the SDGs, followed by the transparent and fair funding approval process, and administrators' perceptions of financial inputs for digital education was the lowest level.

6. Effectiveness of education policy implementation was at high level. Considering the results of this research aspects ranged from the highest to lowest level were as follow: the highest level was administrators think that education policy implementation can provide clear guidance, followed by administrators think college has effective education policy outreach mechanisms, and administrators' perceptions of whether digital education initiatives are adequately resourced and supported by policy implementation was the lowest level.

Part 2: The guidelines for improving digital education initiatives in vocational colleges in Yunnan

The guidelines for improving digital education initiatives in vocational colleges in Yunnan were six aspects, which contain 37 measures. Specifically, there are six measures to improve the current digital educational resources to better meet the needs of the digital education Initiative. There are five measures to improve the integration and utilization of digital technologies through enhancements in the college's networking infrastructure. There are six measures to improve the establishment of a systematic guidance program and a unified digital management platform for education transformation, as perceived by administrators. There are six measures to improve the implementation of initiatives that emphasize and foster digital competence among staff and students in the realm of digital literacy. There are seven measures to improve the addressing of factors contributing to administrators' perceptions that financial inputs for digital education are insufficiently supporting initiatives. There are seven measures to improve the overall effectiveness

of digital education initiatives by enhancing the alignment of policy resources and support within the college's education policy implementation.

1. To improve the current digital educational resources to better meet the needs of the digital education Initiative (6 measures: Increase the introduction of resources; Enhance teacher training and education literacy; Expanding digital teaching scenarios; Strengthen cooperation with industry; Focus on student participation and feedback; Continuous evaluation and improvement).

2. To improve the integration and utilization of digital technologies through enhancements in the college's networking infrastructure (5 measures: Enhance network bandwidth and coverage; Optimize network equipment and facilities; Construction of digital campus; Provide diversified network services; Continuously monitor and optimize network operation).

3. To improve the establishment of a systematic guidance program and a unified digital management platform for education transformation, as perceived by administrators (6 measures: Formulate a clear plan for education transformation; Establishment of cross-departmental collaboration mechanism; Introduce advanced digital management tools; Enhance teacher training and support; Establish a data statistics and analysis platform; Strengthen the monitoring and evaluation mechanism).

4. To improve the implementation of initiatives that emphasizes and fosters digital competence among staff and students in the realm of digital literacy (6 measures: Conduct systematic digital literacy training; Establish a digital learning platform; Promote digital teaching modes; Establish digital learning community; Strengthen the practice and application links; Establishment of evaluation system and incentive mechanism).

5. To improve the addressing of factors contributing to administrators' perceptions that financial inputs for digital education are insufficiently supporting initiatives (7 measures: Formulate a financial expenditure plan for digital education; Optimize the allocation of financial resources; Expanding external funding channels; Establish evaluation mechanism for digital education projects, Enhance financial

transparency and openness; Promote internal resource sharing and collaboration; Establish long-term planning and sustainable development mechanism).

6. To improve the overall effectiveness of digital education initiatives by enhancing the alignment of policy resources and support within the college's education policy implementation (7 measures: Formulate a clear digital education policy; Strengthen policy publicity and training; Establishment of a monitoring mechanism for the implementation of the policy; Promote interdepartmental collaboration and communication; Strengthen data analysis and evaluation; Establish feedback mechanism and advocate opinion exchange; Strengthen the connection with external partners).

Part 3: The adaptability and feasibility of the guidelines improving digital education initiatives in vocational colleges in Yunnan

The suitability and feasibility of the purpose model for improving digital education initiatives in vocational colleges in Yunnan was six aspects were at high level, which means the guidelines for improving digital education initiatives in vocational colleges in Yunnan are adaptability and feasibility.

1. Enhancing current digital educational resources to better align with the objectives of the digital education initiative demonstrated high levels of adaptability and feasibility, with perceived ratings indicating strong potential for implementation.

2. Improving the integration and utilization of digital technologies through enhancements in the college's networking infrastructure showed robust adaptability and feasibility, suggesting favorable conditions for effective deployment and utilization.

3. Enhancing the establishment of a systematic guidance program and a unified digital management platform for education transformation, as perceived by administrators, indicated notable adaptability and feasibility, supporting the viability of these initiatives in practice.

4. Strengthening the implementation of initiatives emphasizing and cultivating digital competence among staff and students in the domain of digital literacy exhibited sound adaptability and feasibility, indicating promising prospects for enhancing digital skills development.

5. Addressing factors contributing to administrators' perceptions of insufficient financial support for digital education initiatives showed credible adaptability and feasibility, highlighting potential pathways to improve financial backing for these initiatives.

6. Enhancing the overall effectiveness of digital education initiatives by aligning policy resources and support within the college's education policy implementation demonstrated substantial adaptability and feasibility, underscoring opportunities for optimizing educational outcomes through policy coherence.

Discussion

The research is the guidelines for improving digital education initiatives in vocational colleges in Yunnan. The researcher summarizes the conclusion into three parts, details as follows:

Part 1: The level of digital education initiatives in vocational colleges in Yunnan

Part 2: Guidelines for improving digital education initiatives in vocational colleges in Yunnan

Part 3: The adaptability and feasibility of the guidelines improving digital education initiatives in vocational colleges in Yunnan

Part 1: The level of digital education initiatives in vocational colleges in Yunnan

Research found that the current situation of digital education initiatives in vocational colleges in Yunnan were at high level in six aspects. Based on the research results, six aspects involved were ranged from the high to low were: effectiveness of education policy implementation, digital transformation of education, digital literacy, financial inputs, digital educational resources and digital technologies. The effectiveness of the implementation of education policies is outstanding. This dimension ranked first out of six, demonstrating that vocational institutions in Yunnan are relatively good at translating policy directives into practical outcomes. The lowest ranking was for digital technology.

Although Yunnan vocational colleges have made great strides, there is still room for improvement. Exploring specific areas of digital technology could reveal opportunities for enhancement. Yunnan Vocational College has made significant progress in digitally transforming its educational processes. This area promises to be a potential model for other institutions. In addition, digital education initiatives are better supported financially. Greater understanding of how these inputs are allocated could guide future resource allocation strategies. Digital education resources are moderately decentralized. Ranking fifth out of the six dimensions, the performance is good, but there is still room for further improvement. In summary, the digital education initiatives in Yunnan vocational colleges generally show a more positive state. While the high level of all dimensions is commendable, the standard deviation highlights areas of variability that need closer scrutiny.

These research findings are consistent with the viewpoints of scholars. For example, Bin and Jie (2012) underscored the significant improvement in infrastructure and faculty construction in Yunnan vocational colleges, attributed to increased government investment and diversified financing channels. This enhancement has bolstered the operational capabilities of these institutions, marking a positive trajectory in vocational education development. However, traditional perceptions of vocational education in Yunnan persist as a barrier, impacting its societal recognition and contributing to disparities compared to national educational standards. In addition, Zhang (2018) highlighted the dual challenge facing Yunnan's vocational education system: balancing enrollment scalability with quality assurance and improving the integration of theoretical learning with practical skills development. These efforts are crucial for aligning educational outcomes with market demands and enhancing the overall professionalism of vocational training.

Wen et al. (2019) discussed the pivotal role of vocational education within Yunnan's higher education landscape, acknowledging both its developmental achievements and ongoing challenges. Issues such as educational quality and societal relevance underscore the need for continuous improvement in curriculum design, teaching methodologies, and internship opportunities. Moreover, Kuper (2020) pointed out the evolving role of technological advancements in shaping vocational

education requirements. This dynamic calls for adaptive educational strategies that align with emerging industry needs, emphasizing the role of digital technologies in enhancing educational effectiveness and relevance. Zhao and Huang (2020) critiqued the current state of digital teaching resources in China, noting deficiencies in reflecting vocational education learning patterns and low utilization rates. Addressing these gaps requires tailored approaches that improve resource design and implementation to better meet the needs of vocational learners. Melnyk et al. (2023) also emphasized the critical impact of digital education initiatives on human capital development, particularly in rural areas. Achieving equitable access to digital educational materials and enhancing educator competencies are essential steps towards maximizing the socioeconomic benefits of digital education in Yunnan.

1. Digital educational resources was at high level. This is because utilizing theories of resource-based view and digital repository management, vocational colleges in Yunnan have curated rich repositories of digital educational resources. Chen and Wang (2022) mentioned that collaborative digital resource development has a positive role in enhancing digital education initiatives. Johnson and Smith (2023) also mentioned that maximizing the effectiveness of digital educational resources is important to facilitate digital education initiatives. Through partnerships with content providers and open educational resource initiatives, these institutions offer diverse learning materials, including multimedia modules, e-books, and online tutorials, catering to varied learning needs and preferences. Administrators expressed high expectations for access to a wider range and quality of digital educational resources. The perceived level of integration and sharing of educational resources in Yunnan is also high. The variable of managers' agreement on the establishment of a resource sharing mechanism has the lowest mean value among the assessed factors, indicating that the consensus of managers on the establishment of a resource sharing mechanism is less consistent. Sufficient strategies and enhanced resource sharing mechanisms are needed to more consistently and effectively enhance Yunnan's digital education initiatives.

2. Digital technologies was at high level. This is because informed by theories of technological integration and innovation diffusion, Yunnan's vocational colleges leverage state-of-the-art digital technologies to enhance teaching and learning experiences. From interactive whiteboards and virtual laboratories to cloud-based learning platforms and mobile applications, these institutions harness digital tools to create immersive learning environments and foster collaboration and creativity. Yunnan has advanced capabilities in adopting digital technologies for integrated management. This reflects strategic alignment with contemporary digital education initiatives. Liu and Smith (2021) pointed out that the current emerging digital technologies used in digital education are virtual reality, augmented reality, artificial intelligence, and block-chain. There are challenges and issues faced when applying emerging digital technologies in digital education initiatives, such as technology maturity, teacher training, privacy and security concerns. Additionally, Park and Kim (2019, p.169-183) suggested that there are groups that may not be able to take full advantage of the educational opportunities presented by digital technologies. This relates to inequalities in terms of access to digital devices, levels of digital literacy, and so on. In the initiative to enhance digital education, digital technology is one of the important means to promote equality and inclusion While the advantages of digital management and communication are clear, the challenges associated with networking require targeted attention. This will ensure a comprehensive and reliable digital infrastructure that effectively supports educational goals.

3. Digital transformation of education was at high level. This is because that grounded in theories of organizational change and transformation leadership, Yunnan's vocational colleges exhibit a proactive stance towards digital education transformation. By embracing digital technologies and pedagogical innovations, these institutions facilitate the integration of digital tools into teaching and learning practices, thereby enhancing educational outcomes and student engagement. The importance of this idea was also emphasized by Li and Fan (2022, p.16-20) and Yang Yanfeng (2023, p.69-71). Administrators acknowledged the college's development of a phased implementation plan for the digital campus. This positive response highlights the strategic planning and alignment with expert validation of this Yunnan vocational

college, demonstrating a well-structured approach to building a digital campus. Administrators agree on the need for a systematic mentoring program for the digital transformation of education, but higher standard deviations indicate more varied views among administrators. In addition, related to the concept of Kotter (1995, p.59) and Bass and Riggio (2006, p.1-20) that leaders need to establish an effective change strategy and implementation plan to ensure that the change is implemented smoothly and achieves the desired results. Further exploration to establish an effective transformation strategy and implementation plan is critical to enhancing digital education initiatives in Yunnan.

      4. Digital literacy was at high level. This is because informed by theories of digital literacy and sociocultural perspectives, vocational colleges in Yunnan prioritize the cultivation of digital literacy among students and faculty. Programs emphasize not only technical skills but also critical thinking, information literacy, and ethical use of technology, empowering individuals to navigate the digital landscape effectively. Administrators strongly agree that managers are able to properly understand the value and role of information technology in the work of the college and the department. Related to the concept of Brown and Xiao (2018, p.42-53) that the goal of developing digital literacy must be closely tied to empowerment, so that both individuals and collectives can feel more energized to help solve some of the larger problems facing the future of humanity in a world of uncertainty. In conclusion, while administrators at vocational colleges in Yunnan showed strong consensus on some aspects of digital literacy, a more comprehensive and consistent approach is needed to improve it. College's increased focus on digital capacity development, coupled with continued support for staff participation in IT communication activities, will help build a more digitally literate education. Demirtas (2023, p.207-221) stated that rapid advances in digital technology require individuals to have certain skills and abilities to perform tasks and solve problems in a digital environment. Reddy et al. (2022, p.570) equally suggested the identical view. This is also in line with the overall objective of the improving digital education initiative. Moreover, Siu Cheung Kong et al. (2014) emphasized the transformation potential of e-learning in fostering 21st century skills through innovative educational practices. This perspective aligns with the need for

Yunnan's vocational colleges to integrate modern pedagogical approaches that enhance digital literacy and adaptability among educators and students alike.

5. Financial inputs was at high level. This is because guided by resource dependency theory and fiscal management principles, Yunnan's vocational colleges demonstrate prudent financial investments in digital education initiatives. Brown and Johnson (2022) suggested that there is a correlation between the level of financial inputs and the outcomes of digital education initiatives. Adequate funding allocation and strategic resource allocation ensure sustainable development and scalability of digital education programs, supporting the acquisition of cutting-edge technologies and educational resources. Financial inputs in digital education have contributed positively to the Yunnan digital education initiative's achievement of the sustainable development goals. Smith and Jones (2023, p.289) proposed that financial inputs in the field of digital education not only promote the digital transformation and modernization of the education sector, but also provide important support for education reform and enhancement of teaching quality, and promote equity and inclusion in education. While administrators at Yunnan vocational colleges have been able to identify the impact of financial inputs on the achievement of the sustainable development goals, there is a general consensus that financial inputs have had a positive impact on the achievement of the sustainable development goals. Addressing these concerns is critical to creating a sustainable financial framework. This can maximize the benefits of digital education initiatives.

6. Effectiveness of education policy implementation was at high level. This is because Yunnan's vocational colleges demonstrate a robust implementation of education policies, guided by theories such as policy diffusion and policy enactment. The alignment between policy objectives and institutional practices ensures a coherent approach to digital education initiatives, fostering a conducive environment for innovation and adaptation. Related to the concept of Wang and Zhang (2021, p.8) and Brown and Taylor (2020, p.503-519) that the capacity to implement digital education policies is influenced by key factors such as governance structures, leadership support, coordination mechanisms and stakeholder collaboration. While there was general agreement among administrators at Yunnan vocational colleges

that the implementation of educational policies provided clear guidance and maintained effective outreach mechanisms, the areas of concern identified emphasized the need for a more comprehensive understanding of the integration of resources and support with the policy goals of the digital education initiative. The resolution of these issues is critical to creating a harmonized policy framework.

While Yunnan's vocational education sector shows financial support for digital education initiatives and commendable progress in policy implementation, there are persistent challenges related to infrastructure development, curriculum alignment, and societal perception that require concerted efforts. Integrating insights from these scholars can inform strategic interventions aimed at further enhancing the quality, relevance, and accessibility of vocational education in Yunnan Province.

Part 2: Guidelines for improving digital education initiatives in vocational colleges in Yunnan

The guidelines for improving digital education initiatives in vocational colleges in Yunnan were six aspects, which contain thirty-seven measures. Specifically, there are six measures to improve the current digital educational resources to better meet the needs of the digital education Initiative. There are five measures to improve the integration and utilization of digital technologies through enhancements in the college's networking infrastructure. There are six measures to improve the establishment of a systematic guidance program and a unified digital management platform for education transformation, as perceived by administrators. There are six measures to improve the implementation of initiatives that emphasize and foster digital competence among staff and students in the realm of digital literacy. There are seven measures to improve the addressing of factors contributing to administrators' perceptions that financial inputs for digital education are insufficiently supporting initiatives. There are seven measures to improve the overall effectiveness of digital education initiatives by enhancing the alignment of policy resources and support within the college's education policy implementation.

Improving digital education initiatives in vocational colleges in Yunnan can be achieved by focusing on six key areas:

1. Increase availability and accessibility of tailored digital educational resources for vocational education. Related to Drozdikova-Zaripova et al. (2020) that the process of digital education must take into account the trends of scientific and technological progress and the requirements of society for the quality of educational services. Purposeful use of digital educational resources is one of the most effective methods.

2. Enhance college networking infrastructure to facilitate digital technology integration and usage. Related to Yu et al. (2023, p.18-23) that digital technologies of higher education colleges requires advanced networking infrastructure. In addition, Yanli and Danni (2021, p.164-167) also argued that digital technology empowers education and at the same time promotes the popularization and promotion of digital education.

3. Establish systematic guidance programs and unified digital management platforms for streamlined education transformation. Related to Zhang (2019) that under the trend of the transformation of digital education, the construction of a comprehensive cultivation of the education system will certainly become a key step in digital education initiatives.

4. Implementing initiatives aimed at enhancing staff and student digital literacy through focused efforts on digital competence, as emphasized by Zhu et al. (2024, p.113-120), and also noted by Ke et al. (2024), underscores the importance of this approach.

5. Address perceptions of insufficient financial inputs for digital education through strategic resource allocation. Nguyen and Lee (2020, p.8) also pointed out that the impact of financial inputs on the outcomes of digital education is multifaceted, which can improve the quality and effectiveness of digital education in general by improving educational resources. In addition, Zhao and Huang (2020, p.7) pointed out that government has invested heavily in the construction of digital teaching resources for vocational education. However, these resources commonly suffer from deficiencies in reflecting the learning patterns of vocational education and low utilization rates.

6. Align policy resources and support to enhance overall effectiveness of digital education initiatives. Garcia and Rodriguez (2017, p.1-20) and Nguyen and Chen (2019, p.345) provided support for this opinion. Moreover, Wen et al. (2019, p.223-237) also mentioned this perspective.

Improving digital education initiatives in vocational colleges in Yunnan involves focusing on six critical areas: enhancing digital educational resources tailored for vocational education needs, upgrading networking infrastructure for seamless technology integration, establishing systematic guidance programs and unified digital platforms, fostering digital competence among staff and students, addressing financial challenges, and aligning policy support for enhanced effectiveness. These efforts are crucial for advancing digital education in response to societal demands and technological progress, as highlighted by various scholars' insights on educational transformation and resource optimization.

Part 3: The adaptability and feasibility of the guidelines improving digital education initiatives in vocational colleges in Yunnan

The suitability and feasibility of the purpose guidelines for improving digital education initiatives in vocational colleges in Yunnan was six aspects were at high level. The guidelines for improving digital education initiatives in vocational colleges in Yunnan demonstrate high adaptability and feasibility across all six aspects. These guidelines address key areas:

1. Resource availability and accessibility: given the specific needs of vocational education, increasing the availability and accessibility of tailored digital educational resources in Yunnan's vocational colleges appears feasible. However, ensuring adaptability requires aligning these resources with the unique demands of vocational education. Zhang (2018, p.411) and Zongmei (2022) also support the need to align resources with the unique needs of vocational education.

2. Networking infrastructure enhancement: improving networking infrastructure is feasible but may face challenges in remote or geographically complex areas. Despite these obstacles, with strategic investment and technological advancements, enhancing infrastructure to facilitate digital technology integration seems achievable. Related Khitrova (2021, p.1-5) also suggested that the modern

system of secondary vocational education requirements for the training of professionals include the active use of digital technologies.

3. Establishing guidance programs and digital platforms: while establishing systematic guidance programs and digital management platforms is feasible, their effectiveness may depend on factors such as institutional readiness and administrative support. Zhu and Hu (2022, p.5) also mentioned this point in their research. Ensuring adaptability requires flexibility to accommodate diverse institutional contexts.

4. Promoting digital competence initiatives: feasibility lies in implementing targeted initiatives to enhance digital competence among staff and students. As a consequence of Melnyk et al. (2023, p.1-9) believed that the development of digital education also requires the establishment of equitable access to digital educational. In addition, adaptability hinges on tailoring these initiatives to address specific skill gaps and learning needs within vocational college settings.

5. Addressing financial inputs: while addressing perceptions of insufficient financial inputs is feasible through strategic resource allocation, actual implementation may face challenges due to budget constraints and competing priorities. By the reason of Brown and Johnson (2022, p.167) emphasized that there is a correlation between the level of financial inputs and the outcomes of digital education initiatives. Adaptability requires flexible funding mechanisms and efficient resource management practices.

6. Aligning policy resources: aligning policy resources appears feasible and essential for enhancing the overall effectiveness of digital education initiatives. However, achieving adaptability necessitates continuous evaluation and adjustment of policies to address evolving needs and challenges in vocational education. Chen and Wang (2022) suggested that a collaborative approach to creating, sharing, and disseminating digital educational resources among educators, institutions, and stakeholders has many benefits. Fostering collaboration, utilizing collective expertise, and building sustainable digital resource repositories can facilitate innovative practices in the digital age. This view is fully supported by Chen and Wang.

The high adaptability and feasibility suggest that it serve as valuable road maps for enhancing digital education initiatives in vocational colleges in Yunnan, facilitating meaningful progress towards achieving digital education goals.

Recommendations

Implications

The results of the research indicate the following recommendations for guidelines to improving digital education initiatives in vocational institutions in Yunnan:

1. Digital educational resources, administrators should be enhancing the acquisition and development of digital educational resources by collaborating with industry partners, leveraging online platforms, and investing in digital content creation.

2. Digital technologies, administrators should be upgrade networking infrastructure to support the integration and utilization of digital technologies, focusing on enhancing network bandwidth, optimizing equipment, and providing diversified network services.

3. Digital transformation of education, administrators should be established a systematic guidance program and a unified digital management platform to facilitate the seamless integration of digital tools and resources into teaching and learning processes.

4. Digital literacy, administrators should be implement initiatives to emphasize and foster digital competence among both staff and students, including comprehensive training programs, workshops, and continuous professional development opportunities.

5. Financial inputs, administrators should be advocate for increased financial support and resources for digital education initiatives, highlighting the importance of investing in digital infrastructure, educational technologies, and capacity building.

6. Effectiveness of education policy Implementation, administrators should be enhance the alignment of policy resources and support within the college's education policy implementation by actively engaging policymakers, stakeholders, and educators in decision-making processes, and promoting a collaborative approach to policy development and implementation.

Future Researches

The current research has certain limitations due to numerous factors. For example, the selection of the scope of the research, the research methodology, the dimensions of the questionnaire, and the design of the interview questions are not sufficiently in-depth. These future research directions below are intended to contribute to the scholarly discourse on enhancing digital education initiatives in vocational colleges and universities in Yunnan, with an emphasis on empirical rigor, integrative frameworks, and practical feasibility assessments:

1. Investigate the evolving landscape of digital educational resources and their impact on pedagogical practices and student outcomes in Yunnan.

2. Explore the integration and effectiveness of various digital technologies (e.g., AI, VR, AR) in enhancing teaching methodologies and learning experiences across educational colleges in Yunnan.

3. Examine the digital transformation of education in Yunnan, focusing on shifts in curriculum design, pedagogical approaches, and institutional frameworks influenced by digital innovations.

4. Assess the levels of digital literacy among educators, students, and administrators in Yunnan, identifying barriers and strategies for improving digital competency across educational settings.

5. Analyze the financial investments and resource allocations associated with digital education initiatives in Yunnan, evaluating their sustainability, equity implications, and long-term impacts on educational outcomes.

6. Evaluate the effectiveness of education policy implementation related to digital initiatives in Yunnan, considering governance structures, stakeholder engagement, policy coherence, and alignment with national and regional educational goals.

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Appendix

Appendix A

List of Specialists and Letters of Specialists Invitation

for IOC Verification

Ref.No. MHESI 0643.14/661

Bansomdejchaopraya Rajabhat University
1061 Itsaraparb Hirunrujee
Thonburi Bangkok 10600

22 January 2024

RE: Invitation to validate research instrument

Dear   Professor Dr. Yan Shaomei, Yunnan Open University

Miss Zhang Yuexing is a graduate student in Doctor of Philosophy Program in Educational Administration of Bansomdejchaopraya Rajabhat University. She is undertaking research entitle "Guideline for Improving Digital Education Initiatives in Vocational Colleges in Yunnan"

The thesis adversity committee has considered that you are an expert in this topic. Your recommendations would be useful for further improvement of this research instrument.

With your expertise, we would like to ask your permission to validate the attached research instrument. Would like to avail ourselves of this opportunity to express our sincere thanks and appreciation for your help.

Sincerely,

(Assistant Professor Dr.Kanakorn Sawangcharoen)
Dean of Graduate School

Bansomdejchaopraya Rajabhat University
Tel.+662-473-7000
www.bsru.ac.th
E-mail: grad@bsru.ac.th

Ref.No. MHESI 0643.14/659

Bansomdejchaopraya Rajabhat University
1061 Itsaraparb Hirunrujee
Thonburi Bangkok 10600

22 January 2024

RE: Invitation to validate research instrument

Dear Professor Dr. Tang Shubo, Yunnan Open University

Miss Zhang Yuexing is a graduate student in Doctor of Philosophy Program in Educational Administration of Bansomdejchaopraya Rajabhat University. She is undertaking research entitle "Guideline for Improving Digital Education Initiatives in Vocational Colleges in Yunnan"

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With your expertise, we would like to ask your permission to validate the attached research instrument. Would like to avail ourselves of this opportunity to express our sincere thanks and appreciation for your help.

Sincerely,

(Assistant Professor Dr.Kanakorn Sawangcharoen)
Dean of Graduate School

Bansomdejchaopraya Rajabhat University
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Ref.No. MHESI 0643.14/662

Bansomdejchaopraya Rajabhat University
1061 Itsaraparb Hirunrujee
Thonburi Bangkok 10600

22 January 2024

RE: Invitation to validate research instrument

Dear   Professor Dr. Yu Jiangying, Yunnan University

Miss Zhang Yuexing is a graduate student in Doctor of Philosophy Program in Educational Administration of Bansomdejchaopraya Rajabhat University. She is undertaking research entitle "Guideline for Improving Digital Education Initiatives in Vocational Colleges in Yunnan"

The thesis adversity committee has considered that you are an expert in this topic. Your recommendations would be useful for further improvement of this research instrument.

With your expertise, we would like to ask your permission to validate the attached research instrument. Would like to avail ourselves of this opportunity to express our sincere thanks and appreciation for your help.

Sincerely,

(Assistant Professor Dr. Kanakorn Sawangcharoen)
Dean of Graduate School

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Ref.No. MHESI 0643.14/663

Bansomdejchaopraya Rajabhat University
1061 Itsaraparb Hirunrujee
Thonburi Bangkok 10600

22 January 2024

RE: Invitation to validate research instrument

Dear   Professor Dr. Tang Junqing, Yunnan University of Finance and Economics

Miss Zhang Yuexing is a graduate student in Doctor of Philosophy Program in Educational Administration of Bansomdejchaopraya Rajabhat University. She is undertaking research entitle "Guideline for Improving Digital Education Initiatives in Vocational Colleges in Yunnan"

The thesis adversity committee has considered that you are an expert in this topic. Your recommendations would be useful for further improvement of this research instrument.

With your expertise, we would like to ask your permission to validate the attached research instrument. Would like to avail ourselves of this opportunity to express our sincere thanks and appreciation for your help.

Sincerely,

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Dean of Graduate School

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Ref.No. MHESI 0643.14/660

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1061 Itsaraparb Hirunrujee
Thonburi Bangkok 10600

22 January 2024

RE: Invitation to validate research instrument

Dear   Professor Dr. Yang Lie, Yunnan Open University

       Miss Zhang Yuexing is a graduate student in Doctor of Philosophy Program in Educational Administration of Bansomdejchaopraya Rajabhat University. She is undertaking research entitle "Guideline for Improving Digital Education Initiatives in Vocational Colleges in Yunnan"

       The thesis adversity committee has considered that you are an expert in this topic. Your recommendations would be useful for further improvement of this research instrument.

       With your expertise, we would like to ask your permission to validate the attached research instrument. Would like to avail ourselves of this opportunity to express our sincere thanks and appreciation for your help.

Sincerely,

(Assistant Professor Dr.Kanakorn Sawangcharoen)
Dean of Graduate School

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Appendix B

Official Letter

Ref.No. MHESI 0643.14/664

Bansomdejchaopraya Rajabhat University
1061 Itsaraparb Hirunrujee
Thonburi Bangkok 10600

22 January 2024

RE: Request for Data Collection

Dear   Sir or Madam

      Miss Zhang Yuexing is a graduate student in Doctor of Philosophy Program in Educational Administration of Bansomdejchaopraya Rajabhat University. She is undertaking research entitle "Guideline for Improving Digital Education Initiatives in Vocational Colleges in Yunnan"

      The thesis adversity committee has considered that you are an expert in this topic. Your recommendations would be useful for further improvement of this research. List of universities and colleges according to the attached document.

      With your expertise, we would like to request to collect the data to be used in the research. Would like to avail ourselves of this opportunity to express our sincere thanks and appreciation for your help.

Sincerely,

(Assistant Professor Dr.Kanakorn Sawangcharoen)
Dean of Graduate School

Bansomdejchaopraya Rajabhat University
Tel.+662-473-7000
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E-mail: grad@bsru.ac.th

No	University and College
1.	Yunnan Vocational College of Mechanical and Electricity
2.	Xishuangbanna Vocational and Technical College
3.	Yuxi Agriculture Vocation-Technical College
4.	Lijiang Teachers College
5.	Dehong teachers College
6.	Honghe Health Vocational College
7.	Zhaotong Health Vocational College
8.	Qujing Vocational and Technical College

Ref.No. MHESI 0643.14/672

Bansomdejchaopraya Rajabhat University
1061 Itsaraparb Hirunrujee
Thonburi Bangkok 10600

22 January 2024

RE: Invitation to evaluate the guideline

Dear   Professor Dr. Dai Benzhong, Yunnan University

Miss Zhang Yuexing is a graduate student in Doctor of Philosophy Program in Educational Administration of Bansomdejchaopraya Rajabhat University. He is undertaking research entitle "Guideline for Improving Digital Education Initiatives in Vocational Colleges in Yunnan"

The thesis adversity committee has considered that you are an expert in this topic. Your recommendations would be useful for further improvement of this research.

With your expertise, we would like to ask your permission to evaluate the attached guideline. Would like to avail ourselves of this opportunity to express our sincere thanks and appreciation for your help.

Sincerely,

(Assistant Professor Dr.Kanakorn Sawangcharoen)
Dean of Graduate School

Bansomdejchaopraya Rajabhat University
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Ref.No. MHESI 0643.14/676

Bansomdejchaopraya Rajabhat University
1061 Itsaraparb Hirunrujee
Thonburi Bangkok 10600

22 January 2024

RE: Invitation to evaluate the guideline

Dear   Professor Dr. Zhang Dongyan, Yunnan Agricultural University

      Miss Zhang Yuexing is a graduate student in Doctor of Philosophy Program in Educational Administration of Bansomdejchaopraya Rajabhat University. He is undertaking research entitle "Guideline for Improving Digital Education Initiatives in Vocational Colleges in Yunnan"

      The thesis adversity committee has considered that you are an expert in this topic. Your recommendations would be useful for further improvement of this research.

      With your expertise, we would like to ask your permission to evaluate the attached guideline. Would like to avail ourselves of this opportunity to express our sincere thanks and appreciation for your help.

Sincerely,

(Assistant Professor Dr.Kanakorn Sawangcharoen)
Dean of Graduate School

Bansomdejchaopraya Rajabhat University
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Ref.No. MHESI 0643.14/666

Bansomdejchaopraya Rajabhat University
1061 Itsaraparb Hirunrujee
Thonburi Bangkok 10600

22 January 2024

RE: Invitation to evaluate the guideline

Dear   Professor Dr. Shen Aixiong, Yunnan Open University

Miss Zhang Yuexing is a graduate student in Doctor of Philosophy Program in Educational Administration of Bansomdejchaopraya Rajabhat University. He is undertaking research entitle "Guideline for Improving Digital Education Initiatives in Vocational Colleges in Yunnan"

The thesis adversity committee has considered that you are an expert in this topic. Your recommendations would be useful for further improvement of this research.

With your expertise, we would like to ask your permission to evaluate the attached guideline. Would like to avail ourselves of this opportunity to express our sincere thanks and appreciation for your help.

Sincerely,

(Assistant Professor Dr.Kanakorn Sawangcharoen)
Dean of Graduate School

Bansomdejchaopraya Rajabhat University
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Ref.No. MHESI 0643.14/670

Bansomdejchaopraya Rajabhat University
1061 Itsaraparb Hirunrujee
Thonburi Bangkok 10600

22 January 2024

RE: Invitation to evaluate the guideline

Dear   Professor Dr. Li Feng, Yunnan Normal University

      Miss Zhang Yuexing is a graduate student in Doctor of Philosophy Program in Educational Administration of Bansomdejchaopraya Rajabhat University. He is undertaking research entitle "Guideline for Improving Digital Education Initiatives in Vocational Colleges in Yunnan"

      The thesis adversity committee has considered that you are an expert in this topic. Your recommendations would be useful for further improvement of this research.

      With your expertise, we would like to ask your permission to evaluate the attached guideline. Would like to avail ourselves of this opportunity to express our sincere thanks and appreciation for your help.

Sincerely,

(Assistant Professor Dr.Kanakorn Sawangcharoen)
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Ref.No. MHESI 0643.14/675

Bansomdejchaopraya Rajabhat University
1061 Itsaraparb Hirunrujee
Thonburi Bangkok 10600

22 January 2024

RE: Invitation to evaluate the guideline

Dear   Professor Dr. Zhang Xiaofeng, Shanghai Normal University

        Miss Zhang Yuexing is a graduate student in Doctor of Philosophy Program in Educational Administration of Bansomdejchaopraya Rajabhat University. He is undertaking research entitle "Guideline for Improving Digital Education Initiatives in Vocational Colleges in Yunnan"

        The thesis adversity committee has considered that you are an expert in this topic. Your recommendations would be useful for further improvement of this research.

        With your expertise, we would like to ask your permission to evaluate the attached guideline. Would like to avail ourselves of this opportunity to express our sincere thanks and appreciation for your help.

Sincerely,

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Ref.No. MHESI 0643.14/677

Bansomdejchaopraya Rajabhat University
1061 Itsaraparb Hirunrujee
Thonburi Bangkok 10600

22 January 2024

RE: Invitation to evaluate the guideline

Dear   Professor Dr. Wei Jiachao, Nanning Normal University

        Miss Zhang Yuexing is a graduate student in Doctor of Philosophy Program in Educational Administration of Bansomdejchaopraya Rajabhat University. He is undertaking research entitle "Guideline for Improving Digital Education Initiatives in Vocational Colleges in Yunnan"

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Ref.No. MHESI 0643.14/665

Bansomdejchaopraya Rajabhat University
1061 Itsaraparb Hirunrujee
Thonburi Bangkok 10600

22 January 2024

RE: Invitation to evaluate the guideline

Dear   Professor Dr. Wang Ruibo, Yunnan Open University

      Miss Zhang Yuexing is a graduate student in Doctor of Philosophy Program in Educational Administration of Bansomdejchaopraya Rajabhat University. He is undertaking research entitle "Guideline for Improving Digital Education Initiatives in Vocational Colleges in Yunnan"

      The thesis adversity committee has considered that you are an expert in this topic. Your recommendations would be useful for further improvement of this research.

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Ref.No. MHESI 0643.14/671

Bansomdejchaopraya Rajabhat University
1061 Itsaraparb Hirunrujee
Thonburi Bangkok 10600

22 January 2024

RE: Invitation to evaluate the guideline

Dear   Professor Dr. Ding Qian, Yunnan Normal University

      Miss Zhang Yuexing is a graduate student in Doctor of Philosophy Program in Educational Administration of Bansomdejchaopraya Rajabhat University. He is undertaking research entitle "Guideline for Improving Digital Education Initiatives in Vocational Colleges in Yunnan"

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Ref.No. MHESI 0643.14/669

Bansomdejchaopraya Rajabhat University
1061 Itsaraparb Hirunrujee
Thonburi Bangkok 10600

22 January 2024

RE: Invitation to evaluate the guideline

Dear   Professor Dr. Ye Weixuan, Yunnan Open University

      Miss Zhang Yuexing is a graduate student in Doctor of Philosophy Program in Educational Administration of Bansomdejchaopraya Rajabhat University. He is undertaking research entitle "Guideline for Improving Digital Education Initiatives in Vocational Colleges in Yunnan"

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Ref.No. MHESI 0643.14/673

Bansomdejchaopraya Rajabhat University
1061 Itsaraparb Hirunrujee
Thonburi Bangkok 10600

22 January 2024

RE: Invitation to evaluate the guideline

Dear   Professor Dr. Ma Huanling, Guangxi Normal University

      Miss Zhang Yuexing is a graduate student in Doctor of Philosophy Program in Educational Administration of Bansomdejchaopraya Rajabhat University. He is undertaking research entitle "Guideline for Improving Digital Education Initiatives in Vocational Colleges in Yunnan"

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Ref.No. MHESI 0643.14/674

Bansomdejchaopraya Rajabhat University
1061 Itsaraparb Hirunrujee
Thonburi Bangkok 10600

22 January 2024

RE: Invitation to evaluate the guideline

Dear   Professor Dr. Li Guanghai, Guangxi Normal University

    Miss Zhang Yuexing is a graduate student in Doctor of Philosophy Program in Educational Administration of Bansomdejchaopraya Rajabhat University. He is undertaking research entitle "Guideline for Improving Digital Education Initiatives in Vocational Colleges in Yunnan"

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(Assistant Professor Dr.Kanakorn Sawangcharoen)
Dean of Graduate School

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Appendix C

Research Instrument

Questionnaire

Dear respondents, in order to gain an in-depth understanding of the digital education initiatives in vocational colleges in Yunnan, this research sincerely invite you to fill out this questionnaire. There is no right or wrong answer and it will take you about 20 minutes. This questionnaire is for academic research purposes only and will not reveal your personal information. Thank you for your sincere help!

ชื่อเรื่อง Research topic:

Guideline for Improving Digital Education Initiatives in Vocational Colleges in Yunnan

ตอนที่ 1 สถานภาพของผู้ตอบแบบสอบถาม

Part 1: General information of the response

1. Your gender

☐ Male

☐ Female

2. Your age is

☐ 20-30years old

☐ 31-40years old

☐ 41-50years old

☐ Over 50 years old

3. Your highest education

☐ Bachelor

☐ Master

☐ Ph.D

☐ Below Bachelor degree

4. What is your position

☐ Head of College

☐ Head of Faculty

☐ Head of Department

☐ Administrator

5. What city in Yunnan are you in

☐ Kunming

☐ Yuxi

☐ Qujing

☐ Zhaotong

☐ Dehong

☐ Lijiang

☐ Honghe

☐ Xishuangbanna

ตอนที่ 2

Part 2: Questionnaire about the current situation of digital education initiatives in vocational colleges in Yunnan.

คำชี้แจง Explanation:

In this part, this research utilizes the scale statistical method. The following 1-5 numbers represent different degrees of approval. Please tick the corresponding level serial number after each statement according to your situation. The higher scores indicate a higher degree of compliance.

Rating Scale

5 = express highest level

4 = express high level

3 = express medium level

2 = express low level

1 = express lowest level

Items	Rating Scale				
	5	4	3	2	1
Digital educational resources (12 questions)					
1 Administrators expect to have access to a wide range and better quality of digital education resources.					
2 Administrators think there is a high degree of integration and sharing of educational resources in digital education.					
3 Administrators think that digital educational resources could meet the needs of the Digital Education Initiative (DEI).					
4 Administrators agree that wired network covers public places such as teaching, activities and offices.					
5 Administrators agree that wireless network covers public places such as teaching, activities and offices.					
6 Administrators agree that college's educational digital resources (digitized teaching and learning materials, course content, digital teaching platform, etc.) can be fully utilized.					
7 Administrators agree that public spaces are equipped with appropriate public terminals (e.g., large-screen TVs, touch-screen computers, etc.).					
8 Administrators agree that lecture halls, conference rooms, libraries and other functional classrooms are equipped with networked multimedia devices.					
9 Administrators agree that the college's digital infrastructure is complete, the digital resources and environment construction covers a wide range, and the application level is high.					

Items	Rating Scale				
	5	4	3	2	1
10 Administrators agree that the college provides data and information that can reflect the overall situation, and can make full use of the data to provide services for teaching and scientific research.					
11 Administrators agree that the college provides data and information that can reflect the overall situation, and can make full use of the data to provide services for management and decision-making.					
12 Administrators agree that college establishes a resource-sharing mechanism to achieve the common construction and sharing of high-quality digital educational resources, and to improve the circulation rate and utilization rate of resources.					
Digital technologies (12 questions)					
13 Administrators agree that vocational college has a high prevalence of digital technologies use.					
14 Administrators agree that vocational college is highly networked.					
15 Administrators agree that vocational college has a high degree of sharing of network resources.					
16 Administrators agree that vocational college has a high level of application of intelligent technology.					
17 Administrators agree that vocational college has a high level of access to and use of intelligent applications in research.					
18 Administrators agree that vocational college has a wide range of applications to meet the needs of teaching and					

Items	Rating Scale				
	5	4	3	2	1
learning and other digital applications, and to support group access during peak periods.					
19 Administrators agree that college is able to apply all levels of platforms to implement digital management of academic affairs, administrative affairs, college conditions and teaching equipment.					
20 Administrators agree that college prioritizes the use of national, provincial, municipal, and county IT application platforms.					
21 Administrators agree that college has a digital publicity platform to realize digital communication with students, parents, and the community.					
22 Administrators agree that college can realize data integration and sharing between various application systems within the college, effectively solving the problem of data silos.					
23 Administrators agree that college is able to realize the connection of personnel, data, applications, and software and hardware resources by combining the education network, campus network, and Internet of Things on campus.					
24 Administrators agree that the college can use intelligent technology to collect, monitor and analyze educational data.					
Digital transformation of education (14 questions)					
25 Administrators agree that the college has a reasonable digital leadership organization, rigorous digital planning and system (policy planning, financial investment, professional training, etc.).					

	Items	Rating Scale				
		5	4	3	2	1
26	Administrators agree that college has formulated a clear vision of the goals of education digital transformation, practice areas, technology application routes and strategies.					
27	Administrators agree that college needs to introduce a systematic guidance program for education digital transformation, formulate a digital management system, and have a unified digital management platform that can ensure standardized processes, timely processing, and long-term storage.					
28	Administrators agree that college has a strong digital education atmosphere.					
29	Administrators agree that college has a digital management platform.					
30	Administrators agree that college can realize digital transformation and intelligent upgrading of teaching and learning, and support teachers and students to carry out independent learning, collaborative learning and inquiry learning, as well as personalized tutoring.					
31	Administrators agree that the administrators understand the development trend of education digital and the guidelines and policies on digital development of education departments at all levels.					
32	Administrators agree that administrators are able to plan, design, implement and improve the college's digital environment.					
33	Administrators agree that the college has established a digitalization policy, with policies and strategic plans					

Items	Rating Scale				
	5	4	3	2	1
focusing on emerging technologies such as artificial intelligence.					
34 Administrators agree that the college is equipped with a combination of specialized and part-time professional staff with reasonable structure and excellent quality in digital campus construction and application, and effectively carries out the daily operation and maintenance of campus digital hardware and software equipment as well as the development of innovative applications.					
35 Administrators agree that the college has developed a master plan and planning for the construction of the digital campus and applied to the higher authorities for review and filing.					
36 Administrators agree that the college has developed a phased implementation programmer for the construction of a digital campus in accordance with the overall plan, which has been validated by relevant experts.					
37 Administrators agree that the college has established sound rules and regulations for the construction, application and management of the digital campus (including campus network, terminal implementation, application platform, application incentives, talent training, information security, etc.)					
38 Administrators agree that the college already maintains a digital in education handholding system and has established a digital build/reform leadership group for designing digital transformation programmers and assessing their feasibility.					

Items	Rating Scale				
	5	4	3	2	1
Digital literacy (11 questions)					
39 Administrators agree that college emphasizes the development of digital competence.					
40 Administrators agree that college offers a full range of information technology (IT) courses.					
41 Administrators agree that staff can participate in various IT exchange activities at all levels.					
42 Administrators agree that college has established a comprehensive training and upgrading system for information technology application skills.					
43 Administrators agree that the college's established system for training and improving skills in the use of information technology has been implemented effectively.					
44 Administrators agree that managers can correctly understand the value and role of information technology in the work of the college and the department.					
45 Administrators agreed that specific measures were in place to support and incentivize IT faculty research in a variety of management system building areas.					
46 Administrators agreed that specific measures were in place that could support and incentivize IT faculty to conduct research on teaching and learning.					
47 Administrators agree on the ability to influence all faculties and staff to work together to achieve the vision of advancing the educational transformation of the college.					
48 Administrators agreed that in moving forward with the educational transformation of the college, administrators were able to plan and build a vision for information technology development.					

Items	Rating Scale				
	5	4	3	2	1
49 Administrators agree that administrators lead all teachers to improve their IT application skills, actively participate in information technology leadership training, and regularly carry out training on the construction and application of digital education to improve the digital literacy of the teaching staff.					
Financial inputs (11 questions)					
50 Administrators think college has enough financial investment in digital education.					
51 Administrators think the funding investment meets the needs of the digital education initiative.					
52 Administrators think the college has a clear budget planning and management mechanism regarding financial commitment.					
53 Administrators think that the financial investment can cover all aspects of the digital education initiative.					
54 Administrators think college has a dedicated funding source to support digital education initiatives.					
55 Administrators think college has a transparent and fair decision-making in terms of funding.					
56 Administrators think college has a transparent and fair approval process in terms of funding.					
57 Administrators think the funding investment could meet the expansion needs of the digital education initiative.					
58 Administrators think the funding investment could meet the development needs of the digital education initiative.					
59 Administrators believe that focusing on funding is important for colleges' digital education initiative.					

Items	Rating Scale				
	5	4	3	2	1
60 Administrators think financial inputs for digital education in colleges are positive for achieving the Sustainable Development Goals (SDGs).					
Effectiveness of education policy implementation (11 questions)					
61 Administrators think education policy implementation can meet the needs of digital education initiatives.					
62 Administrators think that education policy implementation can provide clear guidance.					
63 Administrators think that education policy implementation can provide support.					
64 Administrators think college has effective education policy advocacy.					
65 Administrators think college has effective education policy outreach mechanisms.					
66 Administrators think that the college has effective feedback in the implementation of education policies.					
67 Administrators think that the college has evaluation mechanisms in the implementation of education policies.					
68 Administrators think college has a dedicated policy enforcement agency or team.					
69 Administrators think that college education policy implementation provides opportunities for continuous improvement and optimization.					
70 Administrators think that college has clear criteria and indicators for evaluating the effectiveness of the implementation of education policy.					
71 Administrators think that digital education initiatives are resourced and supported by policy implementation.					

Semi-structured Interview

Research topic: Guideline for Improving Digital Education Initiatives in Vocational Colleges in Yunnan

Interviewee	Background	Interview Date
Interviewee 1	**Education:** Master's degree **Position:** Head of Vocational College **Work experience:**33 years	Feb. 2, 2024
Interviewee 2	**Education:** Doctor's degree **Position:** Head of Section **Work experience:**16 years	Jan. 29, 2024
Interviewee 3	**Education:** Master's degree **Position:** Head of Vocational College **Work experience:**35 years	Jan. 30, 2024
Interviewee 4	**Education:** Master's degree **Position:** Head of Section **Work experience:**18 years	Jan. 29, 2024
Interviewee 5	**Education:** Doctor's degree **Position:** Director of Department **Work experience:**19 years	Jan. 30, 2024
Interviewee 6	**Education:** Master's degree **Position:** Director of Department **Work experience:**26 years	Jan. 31, 2024
Interviewee 7	**Education:** Master's degree **Position:** Head of Section **Work experience:**15 years	Feb. 1, 2024
Interviewee 8	**Education:** Doctor's degree **Position:** Head of Section **Work experience:**18 years	Jan. 29, 2024

Interviewee	Background	Interview Date
Interviewee 9	**Education:** Master's degree **Position:** Head of Administration **Work experience:**25 years	Jan. 30, 2024
Interviewee10	**Education:** Master's degree **Position:** Director of Department **Work experience:**16 years	Feb. 2, 2024
Interviewee11	**Education:** Master's degree **Position:** Head of Section **Work experience:**15 years	Jan. 29, 2024
Interviewee11	**Education:** Master's degree **Position:** Director of Department **Work experience:**20 years	Feb. 3, 2024
Interviewee12	**Education:** Master's degree **Position:** Head of Administration **Work experience:**33 years	Jan. 31, 2024
Interviewee13	**Education:** Doctor's degree **Position:** Director of Department **Work experience:**26 years	Jan. 31, 2024

1. How to improve the current digital educational resources to better meet the needs of the digital education Initiative?

Interviewee 1

In response to the question of how current digital education resources can better meet the needs of digital education initiatives, I believe that we can strengthen cooperation with providers of quality education resources in the region, make full use of geographical resources and enrich the content of digital education resources. It is also important to establish schools' own digital education resource libraries, including digitized teaching materials and online courses, to meet students' diversified learning needs. There is also a good way to continuously strengthen teachers' digital education training can improve their ability to develop and utilize digital education resources.

Interviewee 2

Regarding the issue of educational resources, I think the following suggestions should be adopted: firstly, strengthen the research and evaluation of digital educational resources to understand the digital needs and pain points in teaching and management in schools, and adjust and improve the contents and forms of digital educational resources according to the needs; secondly, strengthen the cooperation with high-quality digital educational resource providers to strive for the introduction and sharing of more high-quality resources in order to enrich the contents and coverage of digital educational resources in schools; at the same time, strengthen the training of teachers in digital education to enhance their abilities in the development and utilization of digital educational resources, so that they can better support the implementation of digital teaching and learning.

Interviewee 3

I believe that the development and integration of digital educational resources can be strengthened, for example, according to the educational needs and characteristics of the Yuxi region, to increase the number of digital educational resources related to the local industry and job market, in order to better meet the needs of students' vocational skills training. Make full use of existing network platforms and online resources to build a digital learning platform. Break the

geographical restrictions to provide students with more convenient and rich learning resources and promote the development and application of digital teaching.

For example, as agriculture is one of the main industries in Yuxi, digital courses involving modern agricultural technology, agricultural product processing and marketing can be offered. Through digital educational resources, students can learn the latest knowledge of agricultural technology and improve the efficiency and quality of agricultural production. Located in the ecologically fragile region of northwestern Yunnan, the Yuxi region can strengthen digital educational resources in ecological environmental protection and governance. Students can learn the theoretical knowledge and practical skills of biodiversity conservation and contribute to the sustainable development of the local ecological environment. In addition, the

Yuxi region, with its rich natural landscape and humanistic history, can offer digital courses related to tourism and cultural heritage. Students can learn about tourism management and cultural heritage protection through digital educational resources, contributing to the development of local tourism and cultural heritage. Currently, the demand for medical and healthcare and health management talents in Yuxi region is also more urgent. Digital courses involving knowledge and skills in medical informatization and health management can be offered to cultivate professionals for the development of local medical and health care.

Interviewee 4

I believe that the digital education resource base of schools can be enriched through the introduction of quality digital education resources, such as online teaching platforms, teaching videos and e-books. For example, the following two types of high-quality digital education resources can be introduced:

1. Online education platforms, such as China University MOOC (Mucous Class), Coursera, edX, etc. These platforms provide a rich variety of online course resources covering various subject areas, including engineering, agriculture, medicine, and economics and so on. Students can learn independently through these platforms to improve their learning interests and abilities. At the same time, schools can also cooperate with these platforms to introduce relevant course resources to provide students with richer learning opportunities.

2. Introducing high-quality teaching video resources, covering a variety of teaching contents and forms, such as experimental videos, field trip videos, and professional skills operation videos and so on. These video resources can enrich the classroom teaching content and improve students' learning effect and participation. At the same time, teachers can also utilize these video resources for teaching assistance to help students better understand and master their knowledge.

Interviewee 5

I emphasize the construction of digital education resources related to the development of local industries to meet the needs of digital education initiatives. For example, in response to the characteristics of the major industries in the Qujing area, relevant digital teaching resources have been developed and introduced, such as

those in the fields of agricultural technology, health care and tourism services, in order to better serve the career development of students and the needs of society.

Interviewee 6

In response to the insufficient and uneven distribution of resources, resource integration can be strengthened. Specifically, it is to make use of the resources of governments, enterprises and social organizations at all levels inside and outside Qujing to establish a digital education resource sharing platform, promote resource sharing and complementarity of advantages, and ensure the rational use and full sharing of resources. However, the difficulties in establishing a digital education resource sharing platform in Qujing mainly include the following aspects: the first is technical difficulties. The establishment of a digital education resource sharing platform needs to involve a variety of technologies, including network technology, data management technology, security technology and so on. To ensure the stability, security and efficiency of the platform, it is necessary to invest a large amount of technical manpower and material resources, while at the same time solving technical difficulties in technical integration, data interaction and system compatibility. The second is data standardization and integration. Educational resources cover a variety of forms and types, including teaching videos, teaching documents, teaching software, etc., which may come from different sources and formats. To establish a unified platform for sharing digital educational resources, it is necessary to standardize and integrate these resources to ensure a uniform format, identification and classification of the resources. The third is resource sharing awareness and mechanism. The establishment of a digital education resource sharing platform requires the active participation and support of all schools and units, but there are certain difficulties and obstacles due to the distribution of benefits and management mechanisms for resource sharing. To solve these problems, it is necessary to establish a perfect resource sharing mechanism and incentive mechanism to promote the resource sharing awareness and enthusiasm of all parties. The fourth is security and privacy protection. Digital educational resources involve a large amount of teaching and learning data, including students' personal information, learning achievements and other sensitive data. The establishment of a digital education resource sharing

platform must guarantee data security and privacy protection to prevent data leakage and illegal use, and at the same time follow relevant laws and regulations and privacy policies to protect the legitimate rights and interests of users. Finally, there are organizational and management difficulties. The establishment of a digital education resource sharing platform requires a unified organization and management body responsible for the operation, maintenance and management of the platform. It is necessary to establish a clear management system and operation mechanism, clarify the responsibilities and authority of all parties, and improve the operation mechanism and service system to ensure the long-term stable operation and effective management of the platform.

Interviewee 7

Our college combines the characteristic industries of agriculture, tourism and ethnic culture in the Dehong region to develop relevant digital teaching resources, providing students with educational resources that are practical and in line with industrial needs.

Interviewee 8

In order to improve the existing digital educational resources college mainly focuses on two aspects. Firstly, increase the digital teaching content. Optimize the curriculum and introduce more digital teaching resources related to vocational education and Dehong industry development. The second is to improve the quality of resources. Emphasis is placed on strengthening the screening and evaluation of digital educational resources to ensure that the content of the resources is accurate, comprehensive and current.

Interviewee 9

I think optimizing digital educational resources can be combined with the characteristics and development needs of the tourism industry in Lijiang area to strengthen the construction of digital educational resources related to the tourism industry. For example, offer specialized courses in tourism and provide related digital teaching resources to meet students' needs for knowledge about the tourism industry. Specifically, digitized courseware and teaching materials: Produce digitized courseware and teaching materials in various forms, including PPT, PDF, video, etc.,

covering the basic knowledge of the tourism industry, case studies, industry dynamics and other contents. These materials can be released and shared through online platforms or school teaching management systems for students to learn and access at any time. There are also virtual realities teaching resources: Utilizing VR and AR technologies to develop virtual reality teaching resources for tourism destinations. Students can experience the real scenes of tourist attractions through virtual reality devices, such as VR helmets or AR glasses, and learn about the geographic environment and cultural characteristics of the destination, so as to enhance the sense of immersion and experience of learning. In addition, online courses are offered or open network platforms are utilized to provide online courses and resources related to tourism majors. Students can learn all kinds of tourism professional knowledge through the network, participate in online discussions and academic exchanges, and expand their learning horizons and knowledge breadth. Finally, build digital libraries and resource libraries to collect and organize digitized books, journals, theses, reports and other literature related to tourism majors. Students and teachers can search and check the literature through the digital library and resource bank to get the latest academic research results and industry development dynamics.

Through the above methods, rich and diverse digital teaching resources can be provided for the tourism professional courses to meet the learning needs of students and promote the comprehensive improvement of their professional knowledge and skills in the tourism industry.

Interviewee 10

I believe that the collection and integration of digital educational resources can be strengthened, and Internet technology can be utilized to expand access to teaching resources and provide richer and more diverse digital educational resources. It is also possible to carry out digital education projects combined with local culture and tourism resources to provide educational resources with Lijiang's regional characteristics and stimulate students' interest in learning.

Interviewee 11

I consider that improving the existing digital education resources requires strengthening the assessment of existing resources, supplementing and updating

digital education resources in a targeted manner, and upgrading the diversity and quality of teaching contents, including the development of online courses and digital teaching materials, so as to meet different learning needs.

Interviewee 12

I think that firstly, it is necessary to upgrade the quality and quantity of digital education resources. Increase investment and actively introduce and develop high-quality digital teaching resources, including online courses, teaching videos and digital teaching materials, so as to enrich the teaching content and meet the teaching needs of different disciplines and specialties. For example, strengthen the development and integration of digital education resources related to the local tourism industry, including cooperation with related industries such as tourist attractions, hotel management and tour guide services, to provide digital education resources that match the actual work demands. The second is to expand digital teaching scenarios. Using existing digital equipment and network resources, build digital classrooms, laboratories and multimedia classrooms on campus to provide more diversified scenarios and environments for teaching and to enhance the teaching effect and experience.

Interviewee 13

I believe that we can strengthen cooperation with the industry and bring in industry resources and enterprise cooperation to enrich digital education resources and enhance their practicality. For example, industry-academia cooperation programs: actively establishing cooperation programs with local tourism, ecological and environmental protection and other related industries to carry out practical teaching and scientific research cooperation, with a view to cultivating students' skills and literacy to adapt to industrial development. For example, we cooperate with local hotel management enterprises to offer practical courses and provide internship opportunities to help students understand and master the operation and management skills of the industry. Lectures by industry experts: Invite industry leaders and professional and technical personnel to give lectures and trainings at the university to share the latest industry news and technology development trends, helping teachers and students to deeply understand the industry needs and improve

their professional literacy and practical abilities. Construction of training bases: Cooperate with local industry enterprises to build training bases and laboratories provide students with a more realistic and rich practical environment, strengthen practical teaching and cooperation between industry, academia and research, and promote the cultivation of students' practical ability and innovative consciousness. Project cooperation and research: Cooperate with industrial enterprises to carry out scientific research projects, jointly solve technical and management problems in the development of the industry, promote the transformation of scientific and technological achievements and industrial upgrading, and provide teachers and students of the school with more opportunities for practice and space for career development.

Through the above cooperative measures, the school can make full use of industry resources and enterprise power to improve the quality and quantity of digital educational resources, provide students with richer and more practical educational resources, and promote the deep integration and common development between the school and the industry.

In conclusion, the six guidelines can be drawn from the interviews:

1. Increase the introduction of resources: colleges should increase investment and actively introduce high-quality digital education resources, including online courses, teaching videos, digital teaching materials, etc., in order to enrich the teaching content and meet the teaching needs of different disciplines and specialties.

2. Enhance teacher training and education literacy: colleges should increase training for teachers to improve their digital education literacy and teaching level, guide them to use digital education resources for teaching design and practice, and promote the innovation and optimization of education and teaching modes.

3. Expanding digital teaching scenarios: colleges should make use of existing digital equipment and network resources to build digital classrooms, laboratories and multimedia classrooms on campus to provide more diversified scenarios and environments for teaching and to enhance the teaching effect and experience.

4. Strengthen cooperation with industry: colleges should cooperate with local enterprises and industries to share industry resources and practical experience,

carry out school-enterprise cooperation programs, provide students with more practical opportunities and job training, and promote the integration of digital education and industry.

5. Focus on student participation and feedback: colleges should establish a mechanism for students to participate in the construction and evaluation of digital education resources, fully listen to students' opinions and suggestions, adjust and improve digital education resources according to actual needs, and improve the relevance and attractiveness of teaching.

6. Continuous evaluation and improvement: colleges should regularly evaluate and improve digital education resources, timely adjust and optimize the allocation and use of resources, continuously improve the quality and effectiveness of digital education, and ensure that digital education resources can continue to meet the needs of education programs.

With the implementation of the above guidelines, colleges can gradually improve digital education resources, raise the level of digital education, better meet the needs of digital education programs, and promote the healthy development of digital education in colleges.

2. How to improve the integration and utilization of digital technologies through enhancements in the college's networking infrastructure?

Interviewee 1

I believe that first of all, the campus network environment should be optimized to improve the network bandwidth and stability to ensure the smooth operation of digital technology. It is also important to strengthen network security measures so that the safe use of digital technology resources can be guaranteed. Advanced digital technology equipment and tools can also be introduced to enhance teaching efficiency and quality.

Interviewee 2

With regard to how to improve the integration and utilization of digital technology by improving the network infrastructure of schools, I think the most basic thing to do is to upgrade and remodel the campus network to enhance the network bandwidth and coverage, which is what we are doing. Secondly, we should strengthen

the updating and maintenance of network equipment to ensure the normal operation and use of digital technology equipment, so as to improve the efficiency and quality of digital teaching and learning. At the same time, we should strengthen the training of network technology for teaching staff, so as to enhance their ability in network application and their awareness of information security, so as to better support the advancement of digital education.

Interviewee 3

Regarding how to improve the integration and utilization of digital technology by strengthening the school network infrastructure, I believe that we can increase the investment and construction of the campus network to enhance the network bandwidth and coverage if the school funds can support it. Secondly, the construction of digital teaching centers, equipped with advanced digital teaching equipment and software, to enhance the teaching effect and quality.

Interviewee 4

College has now invested more in improving the network infrastructure of schools, upgrading the network bandwidth and stability so that students and teachers can access and utilize digital education resources more conveniently.

Interviewee 5

Our college has improved the integration and utilization of digital technology by improving the campus network infrastructure. We intend to invest in upgrading the network equipment and improving the bandwidth and coverage, so as to provide a more stable and efficient network environment for teaching and learning, and to promote the wide application of digital technology in education.

Interviewee 6

Currently, more investment has been made in the campus network infrastructure to enhance the network bandwidth and coverage to ensure the smooth conduct of teaching, research and management.

Interviewee 7

Funds have been invested in strengthening the network infrastructure of schools, upgrading network equipment, expanding network coverage and upgrading

bandwidth to provide a more stable and efficient network environment for teaching and learning.

Interviewee 8

Strengthening the network infrastructure college has done the following: one is to improve the network bandwidth and stability. Increased investment in network equipment to improve campus network coverage and signal stability, to ensure that teachers and students in the teaching and learning process of the network smooth. Secondly, the network coverage has been expanded. Wireless networks are deployed in various areas of the campus to meet the diverse digital teaching needs of teachers and students.

Interviewee 9

Lijiang to increase investment in campus network infrastructure, enhance network bandwidth and stability is an important and complex task, facing many difficulties: First, the geographical environment is complex. Lijiang is located in the plateau mountainous area, the geography is complex, the terrain has great ups and downs, there are some remote areas of network coverage difficulties, the construction of communication facilities are limited. Secondly, the construction cost of network facilities is high. Due to the complex terrain and remote location, the construction and maintenance costs of network facilities are high. It is a challenge to invest a large amount of money in upgrading and remodeling network facilities. Third, the technology is changing. Network technology is changing rapidly, which requires constant equipment renewal and technology upgrading to keep the network facilities advanced and stable. However, the process of technology upgrading may lead to problems such as equipment incompatibility and unstable operation, which need to be carefully planned and managed. Finally, diversification of user needs: The needs of university teachers and students for the network are increasingly diversified, including online teaching, research cooperation, campus life and other aspects. In response to the above difficulties, the collage's directors have thought of many ways. Firstly, they hope that the government will increase the investment in campus network infrastructure and provide enough funds to support the upgrading and remodeling of network facilities. According to the actual situation of the school,

formulate long-term network planning, rationally plan the construction and maintenance of network facilities, scientifically manage network resources, and improve network bandwidth and stability. Actively introduce advanced network technologies and equipment, such as fiber optic network, high-performance routers, etc., to enhance the network bandwidth and stability, and to meet the growing network needs of teachers and students.

Interviewee 10

I think it is necessary to increase investment in campus network infrastructure, optimize network coverage and signal stability, ensure good network signals in teaching buildings, dormitories and other places, and improve the integration and utilization efficiency of digital technology. Introduce advanced network technologies, such as fiber optic networks, to enhance network bandwidth and stability and meet the needs of teachers and students for digital educational resources.

Interviewee 11

I believe that improving the college's network infrastructure requires increasing network bandwidth and stability, optimizing network coverage, and improving the speed and stability of network connections to ensure that students and faculty are able to smoothly use digital technology for teaching and learning.

Interviewee 12

I believe that more investment can be made to optimize the campus network infrastructure and to enhance the network bandwidth and stability to support the integration and utilization of digital technologies and to ensure that teachers and students can have smooth access to digital education resources.

Interviewee 13

I think it is possible to increase investment in campus network infrastructure to improve network bandwidth and stability to ensure smooth teaching, learning and management activities. It is also able to create an intelligent campus and build a wireless network covering the whole campus to provide a convenient digital learning environment.

In conclusion, the five guidelines can be drawn from the interviews:

1. Enhance network bandwidth and coverage: colleges should increase network bandwidth, expand campus network coverage, and ensure stable and smooth network connection to meet the needs of teaching, learning and management.

2. Optimize network equipment and facilities: colleges should update and upgrade network equipment, introduce advanced network technologies and facilities, improve the performance and stability of network equipment, and enhance network service quality and user experience.

3. Construction of digital campus: colleges should promote the digital construction of campus, establish a digital campus platform, integrate all kinds of digital resources and services, and provide teachers and students with convenient online learning and life services.

4. Provide diversified network services: colleges should provide diversified network services, including network video conferencing, online teaching platforms, digital libraries, etc., to meet the diversified learning and communication needs of teachers and students.

5. Continuously monitor and optimize network operation: colleges should establish a network monitoring and evaluation mechanism, regularly monitor and evaluate network operation, promptly find and solve network failures and problems, and continuously optimize network operation efficiency and service quality.

The implementation of the above guidelines will enable the college to continuously improve the level and quality of network infrastructure, enhance the integration and utilization of digital technologies, and provide more stable and efficient network support for teaching, learning and management.

3. How to improve the establishment of a systematic guidance program and a unified digital management platform for education transformation, as perceived by administrators?

Interviewee 1

With regard to how to improve the establishment of a systematic guidance plan and a unified digital management platform to facilitate education transformation,

I think it is necessary to set up a specialized leading group for education transformation, formulate a detailed guidance plan and timetable for education transformation, and make clear the division of responsibilities and the steps for promotion. Introducing a professional digital management platform is also a good way to integrate various types of digital resources and information in schools, so as to enhance management efficiency and decision-making.

Interviewee 2

I think it is necessary to set up a specialized leading group for education transformation, formulate a detailed guiding plan and timetable for education transformation, and clarify the division of responsibilities. It is also possible to introduce a professional digital management third party to carry out an assessment of all kinds of digital resources and information in schools, to improve management efficiency and decision-making based on the results of the assessment, and to strengthen the organization and management of educational transformation, so as to ensure the smooth promotion and effective implementation of the transformation work.

Interviewee 3

As regards how to improve the establishment of a systematic guidance plan and a unified digital management platform to promote education transformation, I think that a team of experts on digital education transformation can be set up to formulate a detailed guidance plan and an implementation plan for digital education transformation, so as to promote the innovation and upgrading of education and teaching modes. At the same time, a unified digital education management platform should be introduced to enhance management efficiency and service level and promote the overall development of digital education.

Interviewee 4

Our college is already developing a digital management platform suitable for the educational needs of Zhaotong area, integrating teaching, management and service functions to improve the efficiency of management and utilization of educational resources.

Interviewee 5

Our college has established a unified digital management platform for education transformation management and resource integration. This platform enables unified management of teaching resources, teaching progress, student information and other data, improves teaching efficiency and management level, and promotes the comprehensive development of digital education.

Interviewee 6

We are in the process of establishing a unified digital management platform to integrate various information systems such as academic affairs management, student management, and teaching resource management, to enhance management efficiency and information sharing, and to provide data support and decision-making basis for education transformation.

Interviewee 7

College has a digital management platform for education transformation management and resource integration. With this platform, data such as teaching resources, course schedules and student information can be managed in a unified manner to improve teaching efficiency and management and promote the overall development of digital education.

Interviewee 8

According to the actual situation and educational development needs of the college, it has formulated specific educational transformation plans and guidance programs with clear objectives, tasks and timelines. In addition, an advanced digital management system is introduced to integrate information resources in teaching, students, administration and other areas to achieve information sharing and efficient management.

Interviewee 9

College has a basic digital management platform that integrates all kinds of teaching resources and information of the school and improves the efficiency of teaching management and service level. The platform includes functions such as course management, student management and teaching resource management.

Interviewee 10

I believe that the establishment of a digital education management platform that integrates data on teaching, student management, resource management and other aspects can provide a scientific basis for educational decision-making. It is also necessary to set up a specialized digital education management team responsible for formulating systematic guidance programmer and management policies to promote the transformation of digital education.

Interviewee 11

I think it is important to establish a systematic guidance program and a unified digital management platform. Formulating and improving the development plan for digital education, clarifying the objectives and path of education transformation and establishing a unified digital management platform can integrate teaching resources and management information and improve management efficiency and teaching quality.

Interviewee 12

I believe that a dedicated digital education management team can be set up to formulate systematic guidance programs and management policies so as to promote the transformation of digital education and establish a unified digital management platform to integrate data on teaching, student management and other aspects, so as to improve the efficiency of education management.

Interviewee 13

I think that a specialized digital education management department or post can be set up to be responsible for co-ordinating and harmonizing digital education-related matters. Advanced education management software and platforms can also be introduced to establish a sound digital teaching management system and improve the allocation and utilization efficiency of educational resources.

In conclusion, the six guidelines can be drawn from the interviews:

1. Formulate a clear plan for education transformation: colleges should formulate a clear plan for education transformation with clear goals and paths, including digital education resources construction, teaching mode innovation, teacher

training, etc., to lay the foundation for the establishment of a systematic guidance program.

2. Establishment of cross-departmental collaboration mechanism: colleges should strengthen communication and collaboration among departments, establish a cross-departmental organization mechanism for education transformation, coordinate planning and promote education transformation related work, and ensure that all work is carried out in an orderly manner.

3. Introduce advanced digital management tools: colleges should introduce advanced digital management tools and platforms, such as school management information systems, online learning platforms, etc., to realize the unified management and convenient operation of educational resources, teaching management and student services.

4. Enhance teacher training and support: colleges should enhance digital education training and support for teachers, improve their ability to use digital education resources and tools, and increase their enthusiasm and initiative to participate in education transformation.

5. Establish a data statistics and analysis platform: colleges should establish a data statistics and analysis platform to monitor and analyze key data and indicators in the process of education transformation, so as to provide scientific basis and reference for decision-making.

6. Strengthen the monitoring and evaluation mechanism: colleges should establish a sound monitoring and evaluation mechanism to carry out regular evaluation and review of the educational transformation work, identify problems and improvement measures in time to ensure the effectiveness of the educational transformation work.

With the above guidelines, the college can establish a systematic guidance program and a unified digital management platform to promote the smooth promotion and effective implementation of the educational transformation work, and to enhance the quality of education and teaching effectiveness.

4. How to improve the implementation of initiatives that emphasize and foster digital competence among staff and students in the realm of digital literacy?

Interviewee 1

Regarding how to improve the implementation of measures to emphasize and develop digital literacy among staff and students, I think it is crucial to strengthen the curriculum and teaching content of digital literacy education so as to develop students' ability to search for, analyses and use information. Regular training and hands-on activities in digital technology can also be provided so as to enhance the ability of staff to apply digital technology and their sense of innovation.

Interviewee 2

Regarding how to improve the implementation of measures to emphasize and cultivate digital literacy among staff and students, I believe that the strengthening of digital literacy education can be accompanied by the establishment of a relevant incentive mechanism to encourage active digital technology training and capacity enhancement for staff and promote their active participation in digital teaching and management.

Interviewee 3

I believe that strengthening digital literacy training and education for teachers and students is a fundamental way. This can enhance their ability to retrieve, analyze and utilize information, strengthen their application and mastery of digital tools and platforms, and develop their digital learning and innovation skills. It is also important to provide rich and diverse digital learning resources and platforms to stimulate teachers' and students' interest and creativity in learning and to promote the overall development of digital education.

Interviewee 4

In order to strengthen the development of digital literacy among teachers and students, college has carried out digital literacy training for teachers and students to enhance their ability and skills in using digital education resources. For example: 1. online training courses: In cooperation with professional digital education training organizations, customized online training courses are designed and provided. These

courses can cover the basic knowledge, skills as well as best practices of teachers and students in using digital education resources. Through these trainings, teachers and students can systematically learn digital education technologies and flexibly apply them in teaching and learning. 2. Practical Workshops: Organize practical workshops on digital literacy so that teachers and students can participate in the practical use of digital education resources first-hand. For example, a series of practical activities can be carried out, such as producing digital teaching resources, online collaborative projects, and virtual experiments and so on. Through these practical workshops, teachers and students can gain a deeper understanding of the application scenarios of digital educational resources, improve their operational skills, and make better use of digital technology in actual teaching. Such training measures not only help to enhance the digital literacy of teachers and students, but also promote the in-depth development of digital education in schools.

Interviewee 5

In order to strengthen digital literacy, our college constantly organizes digital literacy training for teachers and students, with a particular focus on enhancing their abilities and skills in the digital education environment. We also conduct training courses for different positions and grades to cultivate their awareness and application of information technology and improve their digital literacy level. college encourages staff and students to enhance their digital literacy and sets up a special line for training in the annual budget.

Interviewee 6

We regularly organize training and learning activities related to digital education resources to enhance the digital literacy and skill levels of teachers and students, strengthen their ability and confidence in using digital education resources, and promote the in-depth development of digital education.

Interviewee 7

College organizes digital literacy training for teachers and students to enhance their abilities and skills in the digital education environment. For example, training courses for different positions and grades are organized to develop their

information technology awareness and application skills so as to improve their digital literacy level.

Interviewee 8

College encourages the implementation of digital literacy initiatives. This initiative is realized by providing training in digital technology and conducting digital training courses for teachers and students to enhance their digital literacy and skills. In addition, digital education campaigns are conducted and digital education literacy events are organized to raise awareness and raise the level of importance of digital education among teachers and students.

Interviewee 9

Administrators seek to strengthen the digital literacy of faculty and staff and to enhance their competencies and skills in the digital teaching and learning environment. College organizes training sessions, workshops, and so on, to teach the use of digital teaching tools and teaching techniques and to improve the level of digital literacy among faculty and staff.

Interviewee 10

I think digital literacy courses can be offered to develop students' IT skills and sense of innovation, and to enhance their ability to cope with digital learning and work. Training courses on digital education can also be organized to enhance the digital literacy and teaching standards of teaching staff and promote the development of digital teaching in schools.

Interviewee 11

I believe that more digital education training can enhance the digital skills and abilities of teachers and students. Teachers will be further promoted to utilize digital technologies for pedagogical innovation and to develop students' digital literacy and creativity.

Interviewee 12

I think there is a need for different training depending on different needs. Learning is a very important way to improve digital literacy. For example, digital education courses related to the tourism industry should be offered to cultivate students' digital literacy and practical skills, so as to enhance their competitiveness in

the tourism industry. Digital education training activities for teaching staff are organized to improve their digital technology level and teaching ability to meet the development needs of digital education.

Interviewee 13

I think digital education training and seminars can be organized to enhance the digital competence and skills of teaching staff and students. Teachers and students are encouraged to actively participate in online learning and digital teaching practices to enhance their digital literacy and application skills.

In conclusion, the six guidelines can be drawn from the interviews:

1. Conduct systematic digital literacy training: colleges should conduct systematic digital literacy training, including training courses for teachers and students, covering basic digital skills, information retrieval, network security, etc., in order to enhance their digital competence.

2. Establish a digital learning platform: colleges should establish a digital learning resource platform to provide rich and diversified digital learning resources, including online courses, teaching videos, e-books, etc., so that teachers and students can learn and improve at anytime and anywhere.

3. Promote digital teaching modes: colleges should actively promote digital teaching modes, such as online lectures, distance education, etc., to provide teachers and students with more flexible and convenient ways of learning, and to cultivate their independent learning and information acquisition abilities.

4. Establish digital learning community: colleges can establish digital learning community to provide a platform for teachers and students to communicate and share, promote mutual learning and cooperation, and enhance their digital collaboration and communication skills.

5. Strengthen the practice and application links: colleges should strengthen the practice and application links, through project practice, experimental teaching and other forms, so that teachers and students can apply digital knowledge and skills to real work and life, and improve their practical ability.

6. Establishment of evaluation system and incentive mechanism: colleges can establish a digital literacy evaluation system and an incentive mechanism to assess and reward teachers' and students' digital competence and performance, so as to stimulate their motivation to learn and improve.

With the implementation of the above guidelines, the college can effectively enhance the digital literacy level of teachers and students, and promote the overall development of digital education and the improvement of teaching quality.

5. How to improve the addressing of factors contributing to administrators' perceptions that financial inputs for digital education are insufficiently supporting initiatives?

Interviewee 1

In response to the factors of insufficient funding for digital education, I believe that administrators need to strengthen the management and deployment of funds, rationally plan and allocate funds for digital education, ensure that the funds are used in key areas and projects, and improve the efficiency of the utilization of funds. At the same time, administrators should actively seek all kinds of funding support for digital education and broaden the channels of funding sources to provide more financial support for digital education.

Interviewee 2

With regard to the factor of insufficient investment in digital education funds, excluding the influence of objective factors, I think the ability of managers has a great influence on this factor. Administrators to strengthen the management and deployment of digital education funds, rational planning and distribution of digital education funds to ensure that the funds are used for this matter, improve the efficiency of capital utilization. In addition, managers can use their own human resources to actively strive for all kinds of digital education funding support, to provide more financial support for digital education, to ensure the smooth implementation of digital teaching and management.

Interviewee 3

With regard to how to address the factor of insufficient funding for digital education, I think it is crucial to strengthen the management and utilization of funds for digital education. The establishment of a sound fund management system and monitoring mechanism can ensure the rational allocation and effective utilization of funds. Administrators should actively seek support and funding from the government and the community to broaden the source of funding for digital education, so as to provide more financial security and support for the development of digital education.

Interviewee 4

I attach great importance to strengthening financial management. This is because it will optimize the input and use of digital education resources and ensure that financial resources can better support the implementation and development of digital education initiatives.

Interviewee 5

I believe that there is also a need to increase financial input to support the implementation of digital education initiatives. For example, the procurement and updating of digital education resources should be strengthened, and more digital teaching equipment and software should be provided to meet teaching needs. It is also necessary to enhance the training and support for teachers and students to ensure the smooth progress of digital education projects. Funding is a very important foundation, and I as an administrator attach great importance to the management of this part.

Interviewee 6

In order to strive for more financial support and project funding, college heads have strengthened communication and cooperation with government departments and social funding organizations to increase investment in digital education projects and ensure the sustainable development of digital education resources construction.

Interviewee 7

As a leader in the administration of a higher education college, I believe that there is an urgent need to increase financial input to support the implementation of digital education initiatives. Funds can be used for the procurement and updating of digital education resources and the provision of more digital teaching equipment and software to meet teaching needs. There is also a need to strengthen the training and support for teachers and students in order to ensure the smooth progress of digital education programs.

Interviewee 8

There are many practical problems with financial inputs. For example, financial constraints. Colleges face limited financial budgets to meet the needs of digital education resources construction and development. There is also input prioritization; colleges may prioritize limited financial resources to other aspects, such as infrastructure construction, personnel training, etc., while investing relatively little in digital education resources. Insufficient policy support, local governments or relevant departments do not provide enough financial support for digital education, resulting in the college's financial investment in digital education being limited. In order to solve the problem of insufficient financial input, our college has thought of many ways. The first one is to strive for financial support to strengthen cooperation with the government and enterprises, and to strive for more financial input for the construction and development of digital education resources. Secondly, we strengthen financial management, optimize the structure of fund use, improve the efficiency of financial fund use, and ensure the maximum use of funds for digital education resources construction. College also formulates a reasonable financial budget plan, and incorporates the construction of digital education resources into the annual budget of the college, to ensure sufficient financial input. In addition, it strengthens internal management and establishes a scientific program evaluation and supervision mechanism to ensure that financial inputs can be effectively used for the construction and development of digital educational resources. Finally, it is to broaden the sources of funds. College actively explores other sources of funds, such as applying for special funds and carrying out cooperative projects.

Interviewee 9

In response to the issue of rational allocation of financial support for implementation, college attaches great importance to financial supervision. This ensures transparency and effectiveness in the use of funds and also improves the efficiency of their utilization.

Interviewee 10

I believe that cooperation with local governments and enterprises can be strengthened to strive for more financial support and project sponsorship, so as to improve the sources of funding for digital education projects. It is also possible to optimize the structure of financial expenditure, rationally allocate funds and give priority to the funding needs of digital education projects to ensure their smooth implementation and operation.

Interviewee 11

I think that the factors for solving the lack of financial input in digital education should be strengthened in cooperation with government departments and enterprises. This will enable us to seek more financial support and project funding, broaden the funding channels for digital education resources, rationalize the allocation of financial budgets and prioritize the funding needs for the development of digital education.

Interviewee 12

I think it is important to strengthen cooperation with local governments and enterprises. Administrators need to strive for more financial support and project sponsorship to increase the funding sources for digital education projects and ensure the smooth implementation and operation of the projects. It is also possible to actively apply for various types of educational funds and funding programs to broaden funding channels and increase funding for digital education projects.

Interviewee 13

I believe that we can actively seek support and funding from the government and enterprises, increase the investment in education and emphasize the construction and development of digital education. It is also necessary to improve the efficiency of the use of funds and optimize the allocation of educational

resources to ensure the rational use of funds and the smooth implementation of digital education projects.

In conclusion, the seven guidelines can be drawn from the interviews:

1. Formulate a financial expenditure plan for digital education: colleges should formulate a detailed financial expenditure plan for digital education, specify the use of funds and the proportion of allocation, and ensure sufficient financial input to support the implementation of digital education initiatives.

2. Optimize the allocation of financial resources: colleges should optimize the allocation of financial resources, reasonably allocate funds to digital education-related areas, and ensure that key projects and needs are fully supported.

3. Expanding external funding channels: colleges can actively expand external funding channels, such as applying for government project grants, cooperating with enterprises for sponsorship, etc., so as to increase the sources of funding for digital education and alleviate the financial pressure.

4. Establish evaluation mechanism for digital education projects: colleges should establish evaluation mechanism for digital education projects, evaluate and review the projects regularly, identify and solve the problems of inefficient use of funds in time, and ensure that the funds are effectively utilized.

5. Enhance financial transparency and openness: colleges should enhance financial transparency and openness, and announce the financial expenditures and utilization of digital education to teachers, students and administrators in a timely manner to enhance the trust and understanding of all parties on financial expenditures.

6. Promote internal resource sharing and collaboration: colleges can promote internal resource sharing and collaboration, make full use of existing resources, reduce duplication of inputs and waste, and improve the effectiveness of digital education financial expenditures.

7. Establish long-term planning and sustainable development mechanism: colleges should formulate a long-term digital education development plan, ensure that the financial expenditure on digital education is in line with the College's development strategy, and establish a sustainable financial expenditure mechanism

to provide stable support for the long-term development of digital education.

With the implementation of the above guidelines, colleges can better address what administrators consider to be insufficient financial investment in digital education and ensure that digital education initiatives are fully supported and developed.

6. How to improve the overall effectiveness of digital education initiatives by enhancing the alignment of policy resources and support within the college's education policy implementation?

Interviewee 1

Regarding how to improve the overall effectiveness of digital education initiatives by enhancing the alignment of policy resources and support, I think it is important for administrators to keep abreast of the latest knowledge. For example, it is important to keep abreast of and follow up on the latest developments in national and local policies, and to adjust the school's digital education initiative program in accordance with policy requirements. There is also a need to strengthen cooperation with relevant government departments and agencies to promote the implementation and enforcement of digital education policies and to improve the effective use of policy resources and support.

Interviewee 2

As to how to improve the overall effectiveness of digital education initiatives by strengthening the alignment of policy resources and support, I believe that administrators need to study and understand the latest developments of relevant policies in a timely manner, and adjust the school's digital education initiative programs according to the policy requirements, so as to ensure alignment and consistency with the policy requirements. They also need to maintain good relationships with relevant government departments and organizations. Maintaining good relationships is conducive to promoting the implementation and execution of digital education policies, thus ensuring the smooth implementation and advancement of digital education initiatives.

Interviewee 3

Concerning how to enhance the overall effectiveness of the digital education initiatives by strengthening the alignment of policy resources and support, I believe that it is necessary to pay close attention to the latest developments in national and local policies, so as to make timely adjustments and refinements to the school's digital education initiatives program. In addition, actively seeking policy resources and support is conducive to promoting the implementation and realization of digital education initiatives.

Interviewee 4

I also liaise closely with the education sector to actively seek policy support and funding for college.

Interviewee 5

How can policy support for education be optimized? How can policy support be strengthened to facilitate the effective implementation of digital education initiatives? These are questions that I have been thinking about. I believe that a sound policy system can be established to clarify the objectives and standards of digital education programs and provide the necessary policy support and resources. This is only a beautiful vision at the moment, and it is still difficult to implement, and it requires a multi-sectoral joint plan for implementation.

Interviewee 6

Our college formulates and improves digital education policies, clarifies the guiding principles and policy measures for the construction of digital education resources, provides policy guarantee and support for the development of digital education in schools, and promotes the comprehensive advancement of digital education and the enhancement of quality and efficiency.

First, according to the development needs and educational and teaching objectives of schools, we formulate long-term digital education resources construction plans, and clarify the guiding principles, development objectives, key tasks and time nodes for resources construction, so as to provide clear guidance and guarantee for resources construction. Second, we emphasize policy publicity and training. By organizing special meetings, training lectures and other forms, we publicize

and interpret the relevant policy documents and measures to the whole school staff, strengthen their understanding and recognition of the policy on the construction of digital educational resources, and enhance their participation and enthusiasm. The third is supporting policy support. College establishing a sound policy support system for the construction of digital educational resources, including financial support, technical support, personnel training and other policy measures, to provide the necessary material and institutional protection for the construction of resources, and to stimulate the enthusiasm and creativity of all aspects of the school. The fourth is to strengthen quality assurance and assessment. College establishes a quality assessment system for the construction of digital educational resources, formulates relevant assessment standards and indicator systems, and regularly evaluates and reviews the construction of resources, so as to timely discover problems and deficiencies and take effective measures to improve and perfect them. Finally, it is to expand cooperation channels. Strengthen cooperation and exchange with government departments, business institutions, social organizations and other aspects, jointly promote the construction of digital educational resources, make full use of external resources and strength, enhance the efficiency and effectiveness of resource construction, and achieve the optimal allocation of resources and common development.

Interviewee 7

I think the government can formulate relevant policy documents to specify the objectives, directions and policy measures to support the development of digital education. For example, it can issue guiding documents on the construction of digital education resources, teacher training, campus network construction, and so on, so as to provide policy support and guidance for digital education initiatives. Secondly, the government can increase financial investment in digital education programs and provide more financial support to schools. For example, it can set up special funds for the procurement and updating of digital education resources, subsidize schools to carry out digital education training and project implementation, and improve the implementation effect and coverage of digital education projects. Thirdly, the government can set up an incentive mechanism to reward and recognize the

excellent practices and effectiveness of digital education projects. For example, it can set up a digital education innovation award to encourage schools and teachers to engage in innovative practices in the field of digital education and to improve the motivation and effectiveness of digital education programs. Finally, the government can formulate a special funding policy on the construction of digital education resources and set up a certain scale of funds dedicated to supporting the construction and updating of digital education resources in schools. These funds can be used to purchase digital teaching equipment, develop digital education curricula, build campus network infrastructure and so on, providing schools with the necessary technical and financial support to promote the comprehensive development of digital education.

Interviewee 8

To improve the coherence of policy resources and support, college strives to improve policy implementation mechanisms. This will enhance communication and collaboration between departments and ensure that policy resources and support can be put in place in a timely manner to provide effective support for digital education initiatives.

Interviewee 9

I believe that publicizing the digital education policy can improve the policy understanding and implementation capacity of all relevant departments and schools. Specifically, the implementation and enforcement of the digital education policy will be promoted by organizing seminars and policy interpretation to introduce the content and implementation requirements of the policy documents to schools.

Interviewee 10

I believe that it is important to strengthen communication and collaboration with relevant government departments to promote the integration of education policy resources and support, and to form a policy consensus to promote the smooth implementation of digital education projects. College needs to establish a sound policy implementation mechanism, clarify the responsibilities and tasks of all parties, and strengthen the implementation of policies to ensure that the digital education project achieves the expected results.

Interviewee 11

I believe that improving the consistency of resources and support for education policies requires strengthening communication and coordination with relevant departments to promote the implementation and enforcement of education policies. College has formulated complementary policies and measures to strengthen policy support and resources for the Digital Education Initiative to ensure the smooth implementation of education policies and the overall effectiveness of the digital education initiative.

Interviewee 12

I believe that communication and cooperation with the education authorities can be strengthened to promote the integration of education policy resources and support, and to form a policy consensus so as to improve the implementation of digital education projects. It is also necessary to establish a sound policy implementation mechanism, clarify the responsibilities and tasks of all parties, and strengthen the implementation of policies to ensure that digital education projects achieve the expected results.

Interviewee 13

I believe that the first step is to establish a sound education policy system, strengthen communication and collaboration among government departments at all levels, and form an effective integration of policy resources and support. The second step is to formulate detailed implementation plans and implementation rules, and clarify the responsibilities and tasks of all parties to ensure the smooth promotion and implementation of the digital education plan.

In conclusion, the seven guidelines can be drawn from the interviews:

1. Formulate a clear digital education policy: colleges should formulate a clear digital education policy that specifies the direction, objectives and policy framework for the development of digital education, and provides clear guidance and support for the implementation of education policies.

2. Strengthen policy publicity and training: colleges should strengthen digital education policy publicity and training for staff and students, improve their understanding and awareness of the content and implementation requirements of the policy, and enhance the implementation and effectiveness of the policy.

3. Establishment of a monitoring mechanism for the implementation of the policy: colleges should establish a sound monitoring mechanism for the implementation of the policy, regularly evaluate and monitor the implementation of the education policy, and promptly adjust and improve the policy implementation measures when problems are found, so as to ensure that the policy is put into practice.

4. Promote interdepartmental collaboration and communication: colleges should strengthen collaboration and communication among departments, establish horizontal and vertical linkage mechanisms for policy implementation, form an overall synergy of policy resources and support, and improve the efficiency and effectiveness of policy implementation.

5. Strengthen data analysis and evaluation: colleges should strengthen data analysis and evaluation of the implementation effect of the digital education policy, adjust and optimize the policy measures in a timely manner through data feedback and analysis of the results, and improve the pertinence and effectiveness of policy implementation.

6. Establish feedback mechanism and advocate opinion exchange: colleges should establish a sound policy feedback mechanism, encourage faculty, staff and students to put forward problems and suggestions in policy implementation, promote opinion exchange and sharing, and promote the optimization and improvement of policy resources and support.

7. Strengthen the connection with external partners: colleges should strengthen the connection and cooperation with external partners such as government departments, enterprises and social organizations to jointly promote the implementation and landing of digital education policies, make full use of external resources and support, and enhance the overall effect and influence of digital education initiatives.

With the implementation of the above guidelines, colleges can enhance the consistency of policy resources and support, improve the overall effectiveness of digital education initiatives, and promote the sustainable and healthy development of digital education.

Evaluation Form

ชื่อเรื่อง Research topic: Guideline for Improving Digital Education Initiatives in Vocational Colleges in Yunnan

Guidelines	Suitability					Feasibility				
To improve the current digital educational resources to better meet the needs of the digital education Initiative	5	4	3	2	1	5	4	3	2	1
1. Increase the introduction of resources										
2. Enhance teacher training and education literacy										
3. Expanding digital teaching scenarios										
4. Strengthen cooperation with industry										
5. Focus on student participation and feedback										
6. Continuous evaluation and improvement										
1. Enhance network bandwidth and coverage										
2. Optimize network equipment and facilities										

Guidelines	Suitability					Feasibility				
To improve the current digital educational resources to better meet the needs of the digital education Initiative	5	4	3	2	1	5	4	3	2	1
3. Construction of digital campus										
4. Provide diversified network services										
5. Continuously monitor and optimize network operation										
1. Formulate a clear plan for education transformation										
2. Establishment of cross-departmental collaboration mechanism										
3. Introduce advanced digital management tools										
4. Enhance teacher training and support										
5. Establish a data statistics and analysis platform										
6. Strengthen the monitoring and evaluation mechanism										

Guidelines	Suitability					Feasibility				
To improve the current digital educational resources to better meet the needs of the digital education Initiative	5	4	3	2	1	5	4	3	2	1
1. Conduct systematic digital literacy training										
2. Establish a digital learning platform										
3. Promote digital teaching modes										
4. Establish digital learning community										
5. Strengthen the practice and application links										
6. Establishment of evaluation system and incentive mechanism										
1. Formulate a financial expenditure plan for digital education										
2. Optimize the allocation of financial resources										
3. Expanding external funding channels										
4. Establish evaluation mechanism for digital education projects										

Guidelines	Suitability					Feasibility				
To improve the current digital educational resources to better meet the needs of the digital education Initiative	5	4	3	2	1	5	4	3	2	1
5. Enhance financial transparency and openness										
6. Promote internal resource sharing and collaboration										
7. Establish long-term planning and sustainable development mechanism										
1. Formulate a clear digital education policy										
2. Strengthen policy publicity and training										
3. Establishment of a monitoring mechanism for the implementation of the policy										
4. Promote interdepartmental collaboration and communication										
5. Strengthen data analysis and evaluation										

Guidelines	Suitability					Feasibility				
To improve the current digital educational resources to better meet the needs of the digital education Initiative	5	4	3	2	1	5	4	3	2	1
6. Establish feedback mechanism and advocate opinion exchange										
7. Strengthen the connection with external partners										

Appendix D

The Results of the Quality Analysis of Research

Instruments

Content validity check form for each item
งานวิจัยเรื่อง: Research Title:

Guideline for Improving Digital Education Initiatives in Vocational Colleges in Yunnan

คำชี้แจง ขอให้ผู้ทรงคุณวุฒิพิจารณาความสอดคล้อง ครอบคลุม และความสมบูรณ์ของข้อ
คำถาม กับนิยามและกา ✔ ลงในช่องคะแนนตามความเป็นจริง โดยค่าคะแนนมีดังนี้

Questions		The result of consideration from experts					Suggestions for improvement
		1st	2nd	3rd	4th	5th	
Part 1: General information of the response							
1	Your gender	+1	+1	+1	+1	+1	Agreement
2	Your age is	+1	+1	+1	+1	+1	Agreement
3	Your highest education	+1	+1	+1	+1	+1	Agreement
4	What is your position	+1	+1	+1	+1	+1	Agreement
5	What city in Yunnan are you in	+1	+1	+1	+1	+1	Agreement
Part 2: Questionnaire about the current situation of digital education initiatives in vocational colleges in Yunnan.							
Digital educational resources							
1	Administrators expect to have access to a wide range and better quality of digital education resources.	+1	+1	+1	+1	+1	Agreement
2	Administrators think there is a high degree of integration and sharing of educational resources in digital education.	+1	+1	+1	+1	+1	Agreement

	Questions	The result of consideration from experts					Suggestions for improvement
		1st	2nd	3rd	4th	5th	
3	Administrators think that digital educational resources could meet the needs of the Digital Education Initiative (DEI).	+1	+1	+1	+1	+1	Agreement
4	Administrators agree that wired network covers public places such as teaching, activities and offices.	+1	+1	+1	+1	+1	Agreement
5	Administrators agree that wireless network covers public places such as teaching, activities and offices.	+1	+1	+1	+1	+1	Agreement
6	Administrators agree that college's educational digital resources (digitized teaching and learning materials, course content, digital teaching platform, etc.) can be fully utilized.	+1	+1	+1	+1	+1	Agreement
7	Administrators agree that public spaces are equipped with appropriate public terminals (e.g., large-screen TVs, touch-screen computers, etc.).	+1	+1	+1	+1	+1	Agreement
8	Administrators agree that lecture halls, conference rooms, libraries and other functional classrooms	+1	+1	+1	+1	+1	Agreement

Questions		The result of consideration from experts					Suggestions for improvement
		1st	2nd	3rd	4th	5th	
	are equipped with networked multimedia devices.						
9	Administrators agree that the college's digital infrastructure is complete, the digital resources and environment construction covers a wide range, and the application level is high.	+1	+1	+1	+1	+1	Agreement
10	Administrators agree that the college provides data and information that can reflect the overall situation, and can make full use of the data to provide services for teaching and scientific research.	+1	+1	+1	+1	+1	Agreement
11	Administrators agree that the college provides data and information that can reflect the overall situation, and can make full use of the data to provide services for management and decision-making.	0	+1	+1	+1	+1	Agreement
12	Administrators agree that college establishes a resource-sharing mechanism to achieve the common construction and sharing of high-quality digital educational resources, and to	+1	+1	0	+1	+1	Agreement

Questions		The result of consideration from experts					Suggestions for improvement
		1st	2nd	3rd	4th	5th	
	improve the circulation rate and utilization rate of resources.						
Digital technologies							
13	Administrators agree that vocational college has a high prevalence of digital technologies use.	+1	+1	+1	+1	+1	Agreement
14	Administrators agree that vocational college is highly networked.	+1	+1	+1	+1	+1	Agreement
15	Administrators agree that vocational college has a high degree of sharing of network resources.	+1	+1	+1	+1	+1	Agreement
16	Administrators agree that vocational college has a high level of application of intelligent technology.	+1	+1	+1	+1	+1	Agreement
17	Administrators agree that vocational college has a high level of access to and use of intelligent applications in research.	+1	+1	+1	+1	+1	Agreement
18	Administrators agree that vocational college has a wide range of applications to meet the needs of teaching and learning and other digital applications,	+1	+1	+1	+1	+1	Agreement

Questions		The result of consideration from experts					Suggestions for improvement
		1st	2nd	3rd	4th	5th	
	and to support group access during peak periods.						
19	Administrators agree that college is able to apply all levels of platforms to implement digital management of academic affairs, administrative affairs, college conditions and teaching equipment.	+1	+1	+1	+1	+1	Agreement
20	Administrators agree that college prioritizes the use of national, provincial, municipal, and county IT application platforms.	+1	+1	+1	+1	+1	Agreement
21	Administrators agree that college has a digital publicity platform to realize digital communication with students, parents, and the community.	+1	+1	+1	+1	+1	Agreement
22	Administrators agree that college can realize data integration and sharing between various application systems within the college, effectively solving the problem of data silos.	+1	+1	+1	+1	+1	Agreement
23	Administrators agree that college is able to realize the connection of personnel, data, applications, and software and hardware	+1	+1	+1	+1	+1	Agreement

	Questions	The result of consideration from experts					Suggestions for improvement
		1st	2nd	3rd	4th	5th	
	resources by combining the education network, campus network, and Internet of Things on campus.						
24	Administrators agree that the college can use intelligent technology to collect, monitor and analyze educational data.	+1	+1	+1	+1	+1	Agreement
Digital transformation of education							
25	Administrators agree that the college has a reasonable digital leadership organization, rigorous digital planning and system (policy planning, financial investment, professional training, etc.).	+1	+1	+1	+1	+1	Agreement
26	Administrators agree that college has formulated a clear vision of the goals of education digital transformation, practice areas, technology application routes and strategies.	+1	+1	+1	+1	+1	Agreement
27	Administrators agree that college needs to introduce a systematic guidance program for education digital transformation, formulate a digital management system, and have a unified digital	+1	+1	+1	+1	+1	Agreement

	Questions	The result of consideration from experts					Suggestions for improvement
		1st	2nd	3rd	4th	5th	
	management platform that can ensure standardized processes, timely processing, and long-term storage.						
28	Administrators agree that college has a strong digital education atmosphere.	+1	+1	0	+1	+1	Agreement
29	Administrators agree that college has a digital management platform.	0	+1	+1	+1	+1	Agreement
30	Administrators agree that college can realize digital transformation and intelligent upgrading of teaching and learning, and support teachers and students to carry out independent learning, collaborative learning and inquiry learning, as well as personalized tutoring.	0	+1	+1	+1	+1	Agreement
31	Administrators agree that the administrators understand the development trend of education digital and the guidelines and policies on digital development of education departments at all levels.	+1	+1	+1	+1	+1	Agreement
32	Administrators agree that administrators are able to plan,	0	+1	+1	+1	+1	Agreement

	Questions	The result of consideration from experts					Suggestions for improvement
		1st	2nd	3rd	4th	5th	
	design, implement and improve the college's digital environment.						
33	Administrators agree that the college has established a digitalization policy, with policies and strategic plans focusing on emerging technologies such as artificial intelligence.	+1	+1	+1	+1	+1	Agreement
34	Administrators agree that the college is equipped with a combination of specialized and part-time professional staff with reasonable structure and excellent quality in digital campus construction and application, and effectively carries out the daily operation and maintenance of campus digital hardware and software equipment as well as the development of innovative applications.	+1	+1	+1	+1	+1	Agreement
35	Administrators agree that the college has developed a master plan and planning for the construction of the digital campus and applied to the	+1	+1	+1	+1	+1	

	Questions	The result of consideration from experts					Suggestions for improvement
		1st	2nd	3rd	4th	5th	
	higher authorities for review and filing.						
36	Administrators agree that the college has developed a phased implementation programmer for the construction of a digital campus in accordance with the overall plan, which has been validated by relevant experts.	+1	+1	+1	+1	+1	
37	Administrators agree that the college has established sound rules and regulations for the construction, application and management of the digital campus (including campus network, terminal implementation, application platform, application incentives, talent training, information security, etc.)	+1	+1	+1	+1	+1	
38	Administrators agree that the college already maintains a digital in education handholding system and has established a digital build/reform leadership group for designing digital transformation programmers and assessing their feasibility.	+1	+1	+1	+1	+1	

Questions		The result of consideration from experts					Suggestions for improvement
		1st	2nd	3rd	4th	5th	
Digital literacy							
39	Administrators agree that college emphasizes the development of digital competence.	+1	+1	+1	+1	+1	Agreement
40	Administrators agree that college offers a full range of information technology (IT) courses.	+1	+1	+1	+1	+1	Agreement
41	Administrators agree that staff can participate in various IT exchange activities at all levels.	+1	+1	+1	+1	+1	Agreement
42	Administrators agree that college has established a comprehensive training and upgrading system for information technology application skills.	+1	+1	0	+1	+1	Agreement
43	Administrators agree that the college's established system for training and improving skills in the use of information technology has been implemented effectively.	0	+1	+1	+1	+1	Agreement
44	Administrators agree that managers can correctly understand the value and role of information technology in the work of the college and the department.	0	+1	+1	+1	+1	Agreement

Questions		The result of consideration from experts					Suggestions for improvement
		1st	2nd	3rd	4th	5th	
45	Administrators agreed that specific measures were in place to support and incentivize IT faculty research in a variety of management system building areas.	+1	+1	+1	+1	+1	Agreement
46	Administrators agreed that specific measures were in place that could support and incentivize IT faculty to conduct research on teaching and learning.	0	+1	+1	+1	+1	Agreement
47	Administrators agree on the ability to influence all faculties and staff to work together to achieve the vision of advancing the educational transformation of the college.	+1	+1	+1	+1	+1	Agreement
48	Administrators agreed that in moving forward with the educational transformation of the college, administrators were able to plan and build a vision for information technology development.	+1	+1	+1	+1	+1	Agreement
49	Administrators agree that administrators lead all teachers to improve their IT application	+1	+1	+1	+1	+1	

Questions		The result of consideration from experts					Suggestions for improvement
		1st	2nd	3rd	4th	5th	
	skills, actively participate in information technology leadership training, and regularly carry out training on the construction and application of digital education to improve the digital literacy of the teaching staff.						
Financial inputs							
50	Administrators think college has enough financial investment in digital education.	+1	+1	+1	+1	+1	Agreement
51	Administrators think the funding investment meets the needs of the digital education initiative.	+1	+1	+1	+1	+1	Agreement
52	Administrators think the college has a clear budget planning and management mechanism regarding financial commitment.	+1	+1	+1	+1	+1	Agreement
53	Administrators think that the financial investment can cover all aspects of the digital education initiative.	+1	+1	0	+1	+1	Agreement
54	Administrators think college has a dedicated funding source to support digital education initiatives.	0	+1	+1	+1	+1	Agreement

Questions		The result of consideration from experts					Suggestions for improvement
		1st	2nd	3rd	4th	5th	
55	Administrators think college has a transparent and fair decision-making in terms of funding.	0	+1	+1	+1	+1	Agreement
56	Administrators think college has a transparent and fair approval process in terms of funding.	+1	+1	+1	+1	+1	Agreement
57	Administrators think the funding investment could meet the expansion needs of the digital education initiative.	0	+1	+1	+1	+1	Agreement
58	Administrators think the funding investment could meet the development needs of the digital education initiative.	+1	+1	+1	+1	+1	Agreement
59	Administrators believe that focusing on funding is important for colleges' digital education initiative.	+1	+1	+1	+1	+1	Agreement
60	Administrators think financial inputs for digital education in colleges are positive for achieving the Sustainable Development Goals (SDGs).	+1	+1	+1	+1	+1	
Effectiveness of education policy implementation							
61	Administrators think education policy implementation can meet the needs of digital education initiatives.	+1	+1	+1	+1	+1	Agreement

	Questions	The result of consideration from experts					Suggestions for improvement
		1st	2nd	3rd	4th	5th	
62	Administrators think that education policy implementation can provide clear guidance.	+1	+1	+1	+1	+1	Agreement
63	Administrators think that education policy implementation can provide support.	+1	+1	+1	+1	+1	Agreement
64	Administrators think college has effective education policy advocacy.	+1	+1	0	+1	+1	Agreement
65	Administrators think college has effective education policy outreach mechanisms.	0	+1	+1	+1	+1	Agreement
66	Administrators think that the college has effective feedback in the implementation of education policies.	0	+1	+1	+1	+1	Agreement
67	Administrators think that the college has evaluation mechanisms in the implementation of education policies.	+1	+1	+1	+1	+1	Agreement
68	Administrators think college has a dedicated policy enforcement agency or team.	0	+1	+1	+1	+1	Agreement
69	Administrators think that college education policy implementation provides opportunities for	+1	+1	+1	+1	+1	Agreement

Questions		The result of consideration from experts					Suggestions for improvement
		1st	2nd	3rd	4th	5th	
	continuous improvement and optimization.						
70	Administrators think that college has clear criteria and indicators for evaluating the effectiveness of the implementation of education policy.	+1	+1	+1	+1	+1	Agreement
71	Administrators think that digital education initiatives are resourced and supported by policy implementation.	+1	+1	+1	+1	+1	Agreement

Appendix E

Certificate of English

BSRU BANSOMDEJCHAOPRAYA
RAJABHAT UNIVERSITY

This is to certify that

Miss Yuexing Zhang

Achieved BSRU English Proficiency Test (BSRU-TEP) level

C2

Given on 3rd October 2020

(Assistant Professor Dr Kulsirin Aphiratvoradej)

Director

Appendix F

The Document for Accept Research

มหาวิทยาลัยมหาจุฬาลงกรณราชวิทยาลัย
วิทยาเขตนครศรีธรรมราช
๓/๓ ม.๕ ต.มะม่วงสองต้น อ.เมือง จ.นครศรีธรรมราช ๘๐๐๐๐
โทร. ๐๗๕-๓๔๒๘๗๘ โทรสาร ๐๗๕-๓๔๕๘๖๒

อว.๘๐๒๗ / ๑๑๐

๘ พฤษภาคม ๒๕๖๗

เรื่อง   รับรองการลงบทความวิจัยเพื่อตีพิมพ์ในวารสารมหาจุฬานครทรรศน์

เรียน   นางสาวจาง เยว์ชิง

ตามที่ **นางสาวจาง เยว์ชิง และ. รองศาสตราจารย์ ดร.นิรันดร์ สุธีนิรันดร์ ผู้ช่วยศาสตราจารย์ ดร.พัชรา เดชโฮม และผู้ช่วยศาสตราจารย์ ดร.กุลสิรินทร์ อภิรัตน์วรเดช** ได้ส่งบทความวิจัยเรื่อง **"แนวทางสำหรับการปรับปรุงความคิดริเริ่มด้านการศึกษาดิจิทัลในวิทยาลัยอาชีวศึกษาในยูนนาน"** เพื่อพิจารณาตีพิมพ์ในวารสารมหาจุฬานครทรรศน์ มหาวิทยาลัยมหาจุฬาลงกรณราชวิทยาลัย วิทยาเขตนครศรีธรรมราช ซึ่งได้รับการคัดเลือกเข้าสู่ฐานข้อมูล ของศูนย์ดัชนีการอ้างอิงวารสารไทย (ศูนย์ TCI) ได้ถูกจัดกลุ่มคุณภาพวารสารประจำปี พ.ศ. ๒๕๖๒ ให้เป็น วารสารที่มีคุณภาพกลุ่มที่ ๒ (TCI ฐาน ๒) และอยู่ในฐานข้อมูล TCI จนถึง ๓๑ ธันวาคม ๒๕๖๗ โดยจะดำเนินการจัดพิมพ์ในฉบับต่อไปตามระยะเวลาที่ได้กำหนดไว้ และวารสารมหาจุฬานครทรรศน์ ได้รับบทความวิจัยของท่านเป็นที่เรียบร้อยแล้วนั้น

ในการนี้ วารสารมหาจุฬานครทรรศน์ มหาวิทยาลัยมหาจุฬาลงกรณราชวิทยาลัย วิทยาเขตนครศรีธรรมราช ขอรับรองว่าบทความของท่านได้ผ่านตอบรับเพื่อพิจารณาบทความตีพิมพ์เผยแพร่ในปีที่ ๑๑ ฉบับที่ ๗ (กรกฎาคม ๒๕๖๗) นี้ ซึ่งภายหลังจากนี้บทความจะผ่านการตรวจสอบความถูกต้องทางวิชาการ โดยกองบรรณาธิการวารสารฯ และผู้ทรงคุณวุฒิต่อไป

จึงเรียนมาเพื่อโปรดทราบและดำเนินการต่อไป

เรียนมาด้วยความเคารพ

ปุญญาดา

(นางสาวปุญญาดา จงละเอียด)
บรรณาธิการวารสารมหาจุฬานครทรรศน์
มหาวิทยาลัยมหาจุฬาลงกรณราชวิทยาลัย วิทยาเขตนครศรีธรรมราช

Research Profile

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- Doctor of Philosophy Program in Educational Administration, Bansomdejchaopraya Rajabhat University, in 2021

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