THE GUIDELINES FOR OPTIMIZATION OF INFORMATION MANAGEMENT SYSTEM IN GUANG'AN VOCATIONAL AND TECHNICAL COLLEGE

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THE GUIDELINES FOR OPTIMIZATION OF INFORMATION MANAGEMENT SYSTEM IN GUANG'AN VOCATIONAL AND TECHNICAL COLLEGE

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BY

SHU YI

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This study investigates the optimization of the Information Management System (IMS) at Guang'an Vocational and Technical College using the Technology Acceptance Model (TAM) with external factors through a mixed-methods design. From 290 valid questionnaires (response rate 96.7%, Cronbach's α = 0.853), results showed higher Perceived Usefulness (M = 3.87) but lower Perceived Ease of Use (M = 3.42), while Behavioral Intention was moderate (M = 3.75) and stronger among administrators than lecturers or staff ($p < .01$). External factors such as training (M = 3.22), policy incentives (M = 3.29), and collaboration (M = 3.36) were weak. Open-ended responses highlighted complexity, lack of training, and fragmented data as key barriers. The study recommends improving interface design, training, technical support, data integration, and incentive mechanisms, contributing both to extending TAM and to providing practical strategies for sustainable, user-centered digital management in vocational colleges.

Keyword : Information Management System Technology Acceptance Model Vocational education Usability Training Technical support.

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CHAPTER 1

INTRODUCTION

Background

With the rapid advancement of information technology, the application of Information Management Systems (IMS) has become increasingly prevalent in higher education institutions. As a vocational college dedicated to cultivating skilled professionals, Guang'an AVocational and Technical College has introduced an IMS to improve administrative efficiency, streamline data processing, and enhance service delivery. While the system has contributed positively in several areas, it also exhibits critical weaknesses that hinder its optimal performance. Thus, it is vital to evaluate its current functioning and propose strategies for improvement.

The IMS at Guang'an Vocational and Technical College was designed to manage academic and administrative operations such as student registration, course scheduling, attendance tracking, grade management, and resource allocation. It integrates multiple functional modules and supports interdepartmental communication through a centralized digital platform. Initially, the implementation of the IMS marked a significant shift from manual, paper-based administration to a digitized environment. However, as the system scaled with growing user demand, several challenges have emerged.

One of the most significant issues is the system's low usability. Faculty and staff often report difficulties navigating the system due to its complex interface and

non-intuitive design. For example, users frequently complain about having to navigate through multiple menus to locate basic functions such as attendance records and grade submission. One faculty member stated, "It takes too many unnecessary clicks just to submit students' grades, and sometimes the system crashes during submission." Such specific experiences clearly illustrate the urgency for an interface redesign to enhance overall user experience. Routine tasks like inputting grades or accessing academic reports require multiple steps, leading to inefficiencies and user frustration. As noted by Li (2019), many university IMS platforms in China suffer from poor interface design, which negatively affects user adoption and overall system effectiveness .

Moreover, there is a noticeable gap in user adaptability, particularly among administrative personnel who lack sufficient training and technical familiarity. Despite the system’s capabilities, its benefits are underutilized. To address this gap, the institution should initiate regular training workshops and interactive tutorials to enhance users' familiarity and proficiency with the IMS. Additionally, establishing dedicated support channels and peer mentorship programs could significantly improve user adaptability and confidence in utilizing the system. because many users are unable or reluctant to fully engage with its functionalities. Zhang (2020) emphasizes that without proper training and continuous support, even the most advanced IMS platforms will fail to meet their intended potential.

Technical support inadequacies further exacerbate the situation. For instance, during the recent final examination period, a server crash prevented faculty from

submitting critical grade reports, and it took nearly two days for the technical support team to fully resolve the issue, significantly disrupting academic operations and causing considerable frustration among faculty members. the situation. When system malfunctions occur, such as data errors, login failures, or system crashes during peak usage times, response times from IT support are often delayed. Wang (2021) argues that a responsive and well-staffed support infrastructure is essential for maintaining user confidence and ensuring system reliability, especially during critical administrative periods.

Despite these challenges, the IMS also presents several strengths. Its centralized data management approach improves information accuracy and consistency across departments. Automated processes reduce human error and speed up administrative workflows. Additionally, the system generates analytical reports that assist management in decision-making. However, these advantages are often overshadowed by operational shortcomings that prevent the system from being fully effective.

In light of these observations, there is a clear need to optimize the IMS at Guang'an Vocational and Technical College. Suggested improvements include redesigning the user interface to enhance usability, expanding training programs to improve user competence, and upgrading technical infrastructure to ensure system stability. Furthermore, a structured feedback mechanism should be implemented to collect user insights and continuously refine system functionalities.

In conclusion, while the IMS at Guang'an Vocational and Technical College plays a foundational role in administrative modernization, its current limitations must be addressed. A strategic and user-centered approach to optimization will enable the institution to better leverage digital technologies in fulfilling its educational mission. This study, therefore, aims to investigate user acceptance and identify key operational challenges of the IMS in order to develop targeted optimization strategies.

Research objectives

1. To evaluate how administrators, lecturers, and staff at Guang'an Vocational and Technical College perceive and accept the Information Management System (IMS), with particular focus on their individual perspectives concerning Perceived Usefulness (PU), Perceived Ease of Use (PEOU), and Behavioral Intention (BI).

2. To identify and analyze the key factors that administrators, lecturers, and staff believe influence the effective operation of the IMS, including technical infrastructure, training support, policy incentives, and cross-departmental collaboration.

3. To propose targeted optimization strategies that reflect the specific needs and feedback of administrators, lecturers, and staff, in order to enhance user acceptance of the IMS, increase system usage, and strengthen collaborative efficiency across institutional departments.

Research Questions

1. How do administrators, lecturers, and staff at Guang'an Vocational and Technical College perceive the usefulness, ease of use, and their behavioral intention regarding the IMS?

2. What institutional or technical factors do administrators, lecturers, and staff identify as barriers or facilitators to the effective use of the IMS?

3. What differences exist among administrators, lecturers, and staff in their expectations and suggestions for optimizing the information management system?

Research significance

This study holds both practical and theoretical significance, as it bridges the gap between institutional challenges in system implementation and the development of empirical, user-informed optimization strategies.

Practical Contribution: This research provides data-driven insights into how administrators, lecturers, and staff at Guang'an Vocational and Technical College perceive and interact with the current Information Management System. It identifies existing usability issues and operational challenges, thus enabling the institution to implement more user-centered improvements. The findings can help improve decision-making for system upgrades, training initiatives, and technical support services. Moreover, the optimization guidelines generated from this study can serve as a

practical reference for other vocational institutions undergoing similar digital transformation.

Theoretical Contribution: This study contributes to the academic field by extending the Technology Acceptance Model (TAM) through the inclusion of contextual variables such as infrastructure readiness, interdepartmental collaboration, and policy incentives. By applying this model to a vocational college context in China, the study provides empirical evidence to support the model's adaptability and relevance in less-explored educational settings.

Strategic Value: Beyond improving IMS performance, the ultimate aim of this research is to propose actionable and evidence-based optimization guidelines. These recommendations are designed not only for the internal improvement of Guang'an Vocational and Technical College, but also to offer transferable insights to other similar institutions aiming to modernize their information systems.

Definition of Terms

To facilitate clarity and consistency throughout the study, the following key terms are defined:

Information Management System (IMS): A centralized digital platform that supports administrative and academic processes in educational institutions, including student registration, academic records, course management, and internal communication.

Perceived Usefulness (PU): The degree to which administrators, lecturers, and staff believe that using the IMS will improve their job performance and increase overall task efficiency.

Perceived Ease of Use (PEOU): The extent to which users consider the IMS easy to understand, learn, and operate, with minimal effort or technical challenge.

Behavioral Intention (BI): The likelihood that users will adopt and continuously use the IMS in their work, influenced by their perceptions of its usefulness and ease of use. Digital Literacy & Training Support: The ability of administrators, lecturers, and staff to effectively use information management systems. Proper training and technical support ensure users can maximize the system's potential, improving overall adoption and efficiency.

System Optimization Guidelines: Strategically developed, evidence-based recommendations aimed at enhancing the performance, user experience, and integration of the IMS within Guang'an Vocational and Technical College. These guidelines are grounded in user feedback and empirical analysis. System Adoption: The extent to which users integrate and regularly use an information management system in their daily administrative or academic activities. User Acceptance: The willingness and ability of users to adopt, use, and continue engaging with an information system.

Technology Acceptance Model (TAM): A theoretical model used to explain and predict user acceptance of technology, particularly focusing on how PU and PEOU

influence Behavioral Intention. In this study, TAM serves as the foundational model for structuring the research framework.

External Factors: Contextual influences such as technical infrastructure, training support, interdepartmental collaboration, and institutional policies, which are considered in this study as additional variables that may affect users' attitudes toward the IMS.

Scope of the study

Location of the Study

This study is conducted at Guang'an Vocational and Technical College, a public vocational institution located in Sichuan Province, China. The institution offers a range of technical and academic programs aimed at preparing students for practical careers in various industries. The IMS under investigation has been implemented across administrative and academic departments.

Research Population

The research population comprises three key stakeholder groups within the institution: administrators, lecturers, and staff. These groups were selected because they are the primary users of the IMS and play critical roles in its implementation, daily operation, and overall effectiveness. Students, external IT vendors, and other third-party actors are explicitly excluded from the scope of this research.

Sample

The study will use both probability and purposive sampling techniques to ensure representation and depth. A stratified sampling method will be applied for the quantitative survey to include diverse participants across departments. For the qualitative phase, purposive sampling will be used to select key informants from each group who can provide rich, experience-based insights into system usage and optimization needs. The sampling will be limited to the 2024–2025 academic year to maintain contextual consistency.

Research Variables

This study adopts both internal and external variables to explore user acceptance and system performance, based on an extended Technology Acceptance Model (TAM).

The internal variables, derived from TAM, include:

Perceived Usefulness (PU): The extent to which users believe the IMS improves their job effectiveness.

Perceived Ease of Use (PEOU): The degree to which users find the IMS intuitive and easy to operate.

Behavioral Intention (BI): The likelihood that users will continue to use the system based on their attitudes.

The external variables incorporated to contextualize the model are:

Technical Infrastructure: The availability and reliability of hardware, software, and internet connectivity.

Training and Support Mechanisms: The presence of formal guidance, workshops, and ongoing assistance.

Policy Incentives: Institutional rules, benefits, or mandates that encourage system use.

Interdepartmental Coordination: The extent of collaboration and data-sharing among departments through the IMS.

These variables collectively form the basis for both quantitative analysis (via survey data) and qualitative interpretation (via interviews). Understanding how these factors interact will guide the formulation of practical and user-centered optimization strategies for the IMS at Guang'an Vocational and Technical College.

Research Framework

The conceptual framework for this study is based on the Technology Acceptance Model (TAM), extended by incorporating external influencing factors specific to the vocational college context. According to TAM, users' Behavioral Intention to use a system is influenced by their Perceived Usefulness (PU) and Perceived Ease of Use (PEOU). In this study, the model is contextualized to include external factors such as technical infrastructure, training support, and organizational policy, which may moderate or mediate users' perceptions and intentions.

This extended TAM framework will guide the data collection and analysis process and will help identify barriers and enablers to IMS adoption. More importantly, the framework serves as a foundation for developing evidence-based optimization guidelines tailored to the unique institutional needs of Guang'an Vocational and Technical College.

As illustrated in Figure 1.1, this framework outlines how PU and PEOU directly influence Behavioral Intention (BI), while external factors such as system integration, digital literacy, and policy incentives affect PU and PEOU, thereby indirectly shaping users' intention to adopt the IMS. The model also incorporates control variables, including user role (administrator, lecturer, or staff) and training experience, which may influence individual responses and system interaction.

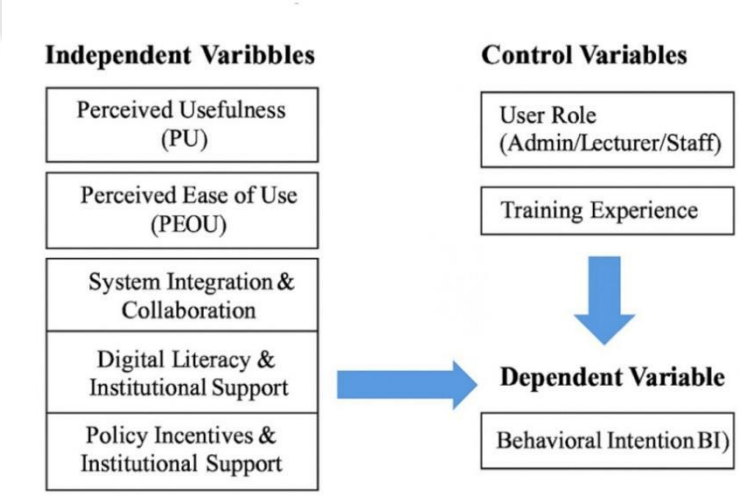

Figure 1 Research Framework Based on the Extended TAM

This framework illustrates the relationships among internal psychological constructs (PU, PEOU), external institutional variables (infrastructure, training, policy),

and user intention to adopt the system. It also reflects the moderating role of user demographics and professional experience.

CHAPTER 2

LITERATURE REVIEW

This study examines the acceptance and adoption of the information management system among administrators, lecturers, and staff at Guang'an Vocational and Technical College. It explores the current state of educational management informatization, identifies key influencing factors, and proposes strategies for optimization. By integrating the Technology Acceptance Model (TAM) and external influencing factors, this study provides insights into user perceptions and institutional support mechanisms for system adoption. This chapter reviews relevant literature and previous studies, covering the following aspects:

1.Background of Educational Management Informatization at Guang'an Vocational and Technical College

2.The Concept of Educational Management Informatization

3.Theoretical Foundations

4.Related Studies on Educational Management Informatization and System Adoption

Background of Educational Management Informatization at Guang'an Vocational and Technical College

For universities, campus informatization involves using information technology to comprehensively transform teaching, research, and management processes, reorganize educational resources, improve efficiency and effectiveness, and

enhance competitiveness. It is a long-term, systematic project(Ren, 2014) . Currently, information infrastructure in Chinese universities has developed rapidly, with campus networks and various information management systems supporting educational and administrative reforms, bringing dynamism to university development. However, due to systemic and other factors, certain deficiencies in informatization still hinder progress.

Through literature review, the main issues identified are as follows:

Insufficient Understanding of Educational Informatization

There is a lack of understanding regarding the purpose and significance of educational informatization in many universities. In 2003, Gao stated, "Educational informatization involves the informatization of educational goals, teaching environments, decision-making, resources, evaluation, management, learning models, and teacher training and research."(Gao et al., 2003) Currently, although universities in China invest significantly in informatization infrastructure, the utilization of these facilities is low due to various factors, limiting students and staff from experiencing its transformative potential. In 2008, Jia noted, "Some universities still focus on hardware over software, speed over planning, management over teaching, and construction over maintenance in informatization efforts. To accelerate progress, understanding of educational informatization needs further improvement."(Jia, 2008)

Management and Maintenance Issues in University Informatization

Most universities emphasize construction over management in educational informatization. Facilities are often put into use immediately after completion, while

management work lags behind. Key issues include inappropriate management structures, undefined authority, insufficiently skilled management personnel, lack of robust management systems, and absence of scientific management standards. These management gaps weaken overall coordination, leading to fragmented resources and operational inefficiencies in informatization systems, severely impacting the development of educational informatization.

In terms of software resources, many universities experience delays in updates. These resources include essential software, as well as data like faculty information, student data, management information, research outcomes, and network resources. In 2017, Xu pointed out, "Failure to update data resources promptly can lead to misinformation. Outdated software versions hinder smooth teaching processes and limit the effectiveness of informatization infrastructure."(Xu, 2007)

Need to Improve Informatization Skills among University Staff

Educational informatization not only improves universities' capabilities but also enhances the digital skills of faculty and students. Faculty are key to the implementation of educational informatization, and their proficiency directly affects its execution and students' learning experience. Currently, many faculty members still adhere to traditional teaching methods, showing limited change in deep teaching practices, thus hindering the progress of informatization.

In 2009, Chen Weidong proposed, "Faculty need to adopt modern educational perspectives on information technology, enhancing their skills in accessing,

processing, and applying information. Integrating new knowledge and information with textbook content allows faculty to stay updated on trends in their fields, expand students' perspectives, inspire critical thinking, and fully leverage the advantages of educational informatization."(Chen et al., 2009)

Current Status of IMS Implementation at Guang'an Vocational and Technical College

Guang'an Vocational and Technical College has implemented an Information Management System (IMS) to enhance the efficiency of administrative and academic operations. The system is designed to support a wide range of functions such as student registration, academic scheduling, attendance tracking, and performance evaluation. However, several challenges remain. Many lecturers and staff report difficulties in navigating the system interface, which often requires multiple steps to complete simple tasks. Additionally, limited training and lack of user support have further reduced adoption rates among users. Management-level staff express concern about data accuracy and reporting consistency due to fragmented system integration across departments. The lack of a user-centered design and the absence of regular system maintenance have also led to low satisfaction levels among users.

In light of these issues, there is an urgent need to assess user perceptions of the IMS and propose targeted optimization strategies. Understanding how administrators, lecturers, and staff interact with the system will provide valuable insights into its effectiveness and areas for improvement. This study therefore positions itself at

the intersection of user experience and institutional management strategy, aiming to guide enhancements to the college's digital infrastructure.

The Concept of Educational Management Informatization

To address the challenges in university management informatization, it is essential to understand its connotations and characteristics and analyze the principles, planning, and mechanisms involved. Based on this understanding, targeted recommendations can be proposed. This section clarifies concepts such as informatization, educational management, and educational management informatization and introduces educational management theory and collaborative theory to lay the foundation for subsequent research.

Educational Informatization

The concept of "informatization" originated in Japan in the 1960s and has since evolved into a core element of national development strategies worldwide. In China, the National Informatization Development Strategy (2006–2020) defined it as a process that leverages information technologies to promote knowledge exchange, resource sharing, and efficiency in economic and social development(The State, 2006). Educational informatization refers specifically to the application of information technology in teaching, research, evaluation, and management processes. It supports the modernization of education by reshaping traditional models and improving educational quality.

Recent policies, such as the Ministry of Education's "Education Informatization 2.0 Action Plan," emphasize the role of information systems in transforming educational governance, promoting equity, and cultivating talent(Ministry of Education, 2018). As Zhang (2020) noted, educational informatization is not only a technical reform but also a fundamental rethinking of pedagogical approaches and management structures .

Educational Management Informatization

Educational management informatization refers to the integration of digital technologies into the administration and governance of educational institutions. It enables data-driven decision-making, improves coordination across departments, enhances operational transparency, and strengthens educational governance capacity. In higher education institutions, this process involves both administrative and academic units and requires cross-functional collaboration among IT professionals, faculty, and administrators.

At Guang'an Vocational and Technical College, educational management informatization is largely implemented through the IMS, which handles functions such as enrollment, grading, timetabling, and performance monitoring. However, the effectiveness of such systems depends on institutional readiness, digital literacy of the staff, infrastructure reliability, and leadership support. As a multifaceted initiative, it requires clear objectives, consistent monitoring, and sustained investment in human and technical resources.

When effectively implemented, educational management informatization becomes a catalyst for institutional modernization. It aligns with broader national goals of educational quality improvement and supports strategic priorities such as governance reform, resource optimization, and talent development. Therefore, understanding the conceptual foundations of educational informatization is critical to identifying improvement pathways for systems like the IMS at Guang'an Vocational and Technical College.

Theoretical Foundations

Information Management Theory

Information management theory provides the foundation for understanding how educational institutions collect, store, process, and utilize information for strategic decision-making. Modern educational management relies on data to guide policy, evaluate institutional performance, and allocate resources. This theory underscores the importance of systematized information flow within organizations and emphasizes the role of management information systems in achieving operational efficiency. By applying this theory, institutions can better align their technological systems with educational goals and user needs.

Synergetics and Digital Governance

Synergetics, introduced by Hermann Haken in 1969, offers a conceptual framework for understanding complex, interrelated systems such as digital governance

in education. It suggests that systems evolve through coordination among multiple components. In the context of educational informatization, synergetics highlights the importance of collaboration between departments, technology providers, and institutional leaders. The successful implementation of IMS depends not only on technical infrastructure but also on institutional synergy, shared goals, and coherent workflows. This theory supports the notion that the optimization of IMS requires coordinated efforts across administrative and academic units.

Technology Acceptance Model (TAM)

The Technology Acceptance Model (TAM), proposed by Davis (1989), is widely used to assess how users accept and adopt new technologies. The model posits that two primary constructs—Perceived Usefulness (PU) and Perceived Ease of Use (PEOU)—determine a user's Behavioral Intention (BI) to use a system.

Perceived Usefulness (PU) – The extent to which a person believes that using a system enhances job performance.

Perceived Ease of Use (PEOU) – The degree to which a person believes that using the system is free of effort.

Behavioral Intention (BI) – The likelihood that a person will continue to use the system.

TAM has been extensively applied in educational settings to evaluate information systems such as Learning Management Systems (LMS) and IMS platforms. Studies have demonstrated that PU and PEOU significantly affect BI, and that

organizational support, user training, and system design influence these perceptions(Venkatesh & Davis, 2000) .

In the case of Guang'an Vocational and Technical College, TAM helps examine how administrators, lecturers, and staff engage with the IMS. The model provides a structured approach for identifying barriers to acceptance and formulating interventions that enhance system adoption. By focusing on PU and PEOU, this research can uncover key leverage points for optimization.

External Influencing Factors (EIFs)

To extend TAM and adapt it to the specific institutional context, this study incorporates several external influencing factors:

System Integration and Interdepartmental Collaboration: Seamless integration of modules and effective communication among departments enhances system utility and efficiency.

Digital Literacy and Training Support: Users' ability to operate the IMS and access to relevant training directly influence perceived ease of use.

Policy Incentives and Institutional Support: Institutional encouragement, mandates, and technical assistance foster positive attitudes and consistent system usage.

These EIFs moderate or mediate the effects of PU and PEOU on BI. Understanding these dynamics is essential for developing targeted optimization strategies. By combining TAM with contextual factors, the research framework gains

explanatory power and practical relevance for guiding IMS enhancement at Guang'an Vocational and Technical College.

Related Studies

Abroad Research Status

Countries such as the United States, Canada, Japan, and South Korea have made significant progress in implementing educational management informatization. In the U.S., the introduction of the Chief Information Officer (CIO) system in higher education, advocated by Vest (2000) , has centralized IT governance and aligned digital transformation with institutional goals . Kenneth C. Green initiated the U.S. Campus Computing Survey in the early 1990s, highlighting digital disparities and advancing ICT policy reform in academia (Sun, 2013). Dewey and DeBlois (2006)emphasized that CIOs should lead performance evaluation systems to improve service quality and governance effectiveness through MIS.

In Canada, national data systems such as Statistics Canada and the Canadian Education Statistics Council support educational planning and accountability by aggregating accurate, policy-relevant data(Zuo, 2014). The government's investment in data infrastructure and unified protocols has enabled regional education departments to better manage human, financial, and pedagogical resources(OECD, 2021) .

Japan's informatization model combines national infrastructure planning with teacher training and digital content creation. Its "Future School" project launched in

2010 deployed personalized learning devices and restructured digital curriculum delivery in primary and secondary education (Wei & Wang, 2013). South Korea has implemented a phased approach since 1996, advancing from infrastructure building to smart learning environments by 2013, supported by strong public investment and multi-level policy coordination (Wu & Yang, 2015).

Common success factors across these countries include centralized governance mechanisms, institutional incentives, faculty training, and cross-departmental collaboration. These experiences offer valuable reference points for China, particularly in strengthening user-centered system design, enhancing interdepartmental integration, and building performance-driven evaluation models.

Domestic Research Status

In China, the Ministry of Education has emphasized digital transformation as a national priority for education reform. Vice Minister Du Zhanyuan pointed out that informatization efforts have reached a new strategic phase focused on application depth and service quality(Sun, 2009). Regional governments, such as those in Guangdong, Guizhou, Guangxi, and Sichuan, have promoted integrated management platforms and remote education systems. Luo (2013) advocated for institution-wide informatization planning and financial investment to support modernization, while Qin (2014) focused on establishing resource-sharing mechanisms and data standardization .

Yu (2023) introduced the Sichuan Cloud Education platform, connecting rural and urban schools through a province-wide digital teaching network . Yang and Li

(2014) proposed collaborative service mechanisms led by government and supported by enterprises and schools. Despite these efforts, many studies remain limited to infrastructure, data management, or administrative perspectives.

Academic research has explored digital governance, data center deployment, and system application in universities. However, few studies address how end-users perceive and engage with IMS. Moreover, vocational colleges—unlike research universities—face unique constraints in training, infrastructure, and administrative capacity, yet remain underrepresented in scholarly discourse.

Summary of Literature Gaps

A review of both international and domestic studies reveals several critical gaps. While countries such as the U.S. and Canada have developed systemic models that integrate educational informatization into institutional governance, localized adaptation strategies in China remain scarce. Existing literature often prioritizes macro-level policy and infrastructure development over micro-level user experience and system usability.

Furthermore, few empirical studies examine IMS adoption in vocational colleges, particularly from the perspective of diverse stakeholders such as administrators, lecturers, and staff. Very limited research integrates TAM with contextual variables like training support and policy incentives in Chinese higher education settings.

This study seeks to address these gaps by applying an extended TAM framework to examine the acceptance and optimization of IMS at Guang'an Vocational and Technical College. By focusing on both individual perceptions and institutional dynamics, the research aims to produce actionable strategies aligned with national informatization goals and localized institutional needs.

Education management informatization as the core engine of education digital transformation, its development history is deeply tied to the iteration of information technology and upgrading of education governance needs, presenting a clear phase evolutionary characteristics. From a global perspective, the development of this field can be roughly divided into three stages: the budding period (2000-2010) is dominated by single-machine version management software applications, the core functions are focused on basic data storage (such as student academic information, teacher files), the technology form is mostly C / S architecture (client / server), typical cases include the early Chinese "primary and secondary school management system" and the U.S. K-12 stage "Student Information System (SIS) basic version".

Development period (2011-2020) With the popularization of cloud computing technology into the "platform construction" phase, countries began to promote the interconnection of education management systems. China released the "Decade Development Plan of Education Informatization (2011-2020)", launched the "National School Information Management System for Primary and Secondary Schools", to achieve unified storage and dynamic management of school data for 180 million

primary and secondary students across the country. The time for school processing was reduced from an average of 7 working days to 1 working day, and the efficiency was increased by more than 85% (Ministry of Education, 2019); the United States launched the "National Education Technology Plan (NETP) 2016", focusing on building a "Scientific Research Data Sharing Platform" for higher education, to promote project data interconnection between universities and research institutions; and the European Union adopted the "Digital Education Action Plan (2018-2020)", to build a transnational education management collaboration system to support mutual recognition of student credits and teacher qualification queries among member countries.

The convergence period (2021-present) is centered on big data and AI technology, and education management informatization has entered the "smart governance" phase. System functions have been upgraded from "management tools" to "decision support carriers", typical applications include: China's "Education Big Data Analysis Platform" to predict student dropout risk by analyzing academic quality data, and a pilot province through this system to control dropout rate below 0.5% (Zhang, 2020); the UK's "Education AI Management System" to automatically generate teacher workload analysis reports to help schools optimize teacher allocation; and Singapore's "Smart Campus Management Platform" to integrate teaching, research, and logistics data to achieve dynamic resource allocation (such as adjusting classroom lighting and air conditioning according to the number of classrooms).

In 2023, China's investment in education informatization accounted for 32% of its education budgets, far exceeding hardware procurement (25%) and teaching resource development (20%); the U.S. federal government allocated $1.2 billion for higher education research management systems, an increase of 40% from 2020; and the Ministry of Education and Science of Japan launched the "Education Management Digital Advancement Plan", which plans to invest ¥200 billion in upgrading management systems at all levels of educational institutions within five years (OECD, 2023). Behind this investment growth is the upgrading of education governance needs — as the scale of education expands (e.g. China's gross enrolment rate in higher education rises from 30% in 2012 to 59.6% in 2023), traditional human-made management models are difficult to cope with the need for massive data processing and refined decision-making, and informatization systems become an inevitable choice(Zhang, 2020) . In the evolutionary process of "Fundamental Adaptation - Scenario Extension - Native Innovation", different theoretical models have formed differentiated interpretative forces for the specificities of educational management scenarios.

The Technology Acceptance Model (TAM) proposed by Davis (1989) is a fundamental theory in the field, with the core assumptions that perceived usefulness (the degree to which users believe that a system can improve productivity) and perceived ease of use (the degree to which users believe that a system is easy to operate) indirectly affect "willingness to adopt" through "use attitudes", and that perceived ease of use has a positive impact on perceived usefulness. The advantage of TAM is

that it is simple in structure and variablely measurable, thus serving as an "introductory framework" for educational management system research.

An early study that introduced TAM into the field of education management was represented by Park et al. (2015), who examined the mechanism of adoption of the curriculum management system in a sample of teacher managers from 120 primary and secondary schools in South Korea. The results showed that both perceptual usefulness (β=0.42, $p<0.001$) and perceptual ease of use (β=0.28, $p<0.01$) had a significant positive effect on willingness to adopt, and that "frequency of system operation training" indirectly promoted adoption by improving perceptual ease of use — managers who received training more than once a week had a 2.3-point (5-point) higher perceptual ease of use score than those who received training once a month. This conclusion was validated in a follow-up Chinese study: Wang et al. (2018) surveyed 300 primary and secondary school teachers in Beijing, Shanghai, etc., and found that the perceptual usefulness of the academic quality monitoring system was mainly reflected in "reducing artificial statistical time" (82% of respondents agreed), while perceptual ease of use was highly correlated with "interface simplicity" ($r=0.63$, $p<0.001$), and "number of operating steps" ($r=-0.58$, $p<0.001$).

However, the limitations of TAM are gradually emerging in the educational scenario: it focuses only on individual cognitive factors, ignoring the "organizational attributes" (e.g. school management attitudes, institutional requirements) and "collaborative attributes" (e.g. interaction between teachers) of education

management. For example, teachers in a rural school considered the curriculum system “useful and easy to use”, but the final adoption rate was still less than 30% because the school did not include the use of the system in the performance assessment (Li, 2019). This has prompted an expanded study of TAM by scholars.

The Unified Technology Acceptance and Use Theory (UTAUT), proposed by Venkatesh et al. (2003), builds a more comprehensive explanatory framework by integrating eight models such as TAM, TPB (Planned Behavior Theory). UTAUT contains four core concepts: performance expectations (perceived usefulness of TAM), effort expectations (perceived ease of use), social impact (the impact of other people's attitudes on users), and contributing factors (technical support provided by the organization, etc.), while introducing four regulatory variables "age, gender, experience, volunteerism".

As the core engine of digital transformation in education, educational management informatization is deeply bound to the iteration of information technology and the upgrading of educational governance needs, presenting clear stage evolution characteristics. From a global perspective, the development of this field can be roughly divided into three stages: the embryonic stage (2000-2010) was dominated by standalone management software applications, with core functions focused on basic data storage (such as student enrollment information and teacher files), and the technical form was mostly C/S architecture (client/server). Typical cases include the early "primary and secondary school enrollment management system" in China and the

"Student Information System (SIS) basic version" in the K-12 stage in the United States. The technical limitations at this stage are significant, with poor system compatibility (software from different schools cannot communicate with each other), low data utilization (only used for information query, without analysis function), and research focus mostly on technical function description, such as software module design and operation process optimization (Li, 2019).

During the development period (2011-2020), with the popularization of cloud computing technology entering the stage of "platform construction", countries began to promote the interconnection of education management systems. China has released the "Ten Year Development Plan for Education Informatization (2011-2020)" and launched the construction of the "National Primary and Secondary School Student Enrollment Information Management System", achieving unified storage and dynamic management of enrollment data for 180 million primary and secondary school students nationwide. The average enrollment processing time has been shortened from 7 working days to 1 working day, and efficiency has been improved by more than 85% (Ministry of Education, 2019); The United States has launched the National Education Technology Program (NETP) 2016, which focuses on building a "research data sharing platform" for higher education and promoting project data exchange between universities and research institutions; The European Union has established a cross-border education management collaboration system through the "Digital Education Action Plan (2018-2020)", supporting mutual recognition of student credits and teacher qualification

queries among member states. At this stage, research has begun to focus on "technological adaptability", such as the compatibility between the system and existing management processes, and the uniformity of data standards (Bai&Li, 2021).

During the integration period (2021 present), with big data and artificial intelligence technology as the core, education management informatization has entered the stage of "smart governance". The system function has been upgraded from a "management tool" to a "decision support carrier", and typical applications include: China's "Education Big Data Analysis Platform" predicts the risk of student dropout by analyzing academic quality data, and a pilot province has controlled the dropout rate below 0.5% through this system (Zhang, 2020); The UK's' Education Artificial Intelligence Management System 'automatically generates teacher workload analysis reports to assist schools in optimizing teacher allocation; The "Smart Campus Management Platform" in Singapore integrates teaching, research, and logistics data to achieve dynamic resource allocation (such as adjusting classroom lighting and air conditioning based on the number of students). At this point, the research paradigm undergoes a fundamental shift from a "technology function oriented" approach to a "adoption mechanism and effectiveness evaluation oriented" approach. Scholars generally believe that the successful implementation of a system not only relies on technical performance, but also requires solving non-technical problems such as organizational collaboration, user cognition, and institutional safeguards (Al Emran et al., 2020).

From the perspective of global investment scale, education management informatization has become a key area of education budget in various countries. In 2023, the proportion of management system construction in China's education informatization investment will reach 32%, far exceeding hardware procurement (25%) and teaching resource development (20%); The US federal government has allocated $1.2 billion in special funding for the higher education research management system, an increase of 40% compared to 2020; The Ministry of Education, Culture, Sports, Science and Technology of Japan has launched the "Digital Promotion Plan for Education Management", which plans to invest 200 billion yen over the next five years to upgrade the management systems of educational institutions at all levels (OECD, 2023). Behind this increase in investment is the upgrading of educational governance needs - as the scale of education expands (such as China's higher education gross enrollment rate increasing from 30% in 2012 to 59.6% in 2023), traditional manual management models are unable to cope with the demands of massive data processing and refined decision-making, and information systems have become an inevitable choice (Zhang, 2020). The technology acceptance theory is the mainstream framework to explain users' adoption behavior of information systems. Its application in the field of education management has gone through the evolution process of "basic adaptation scenario expansion local innovation". Different theoretical models have formed differentiated explanatory power for the particularity of education management scenarios.

The Technology Acceptance Model (TAM) proposed by Davis (1989) is a foundational theory in this field, whose core assumption is that perceived usefulness (the degree to which users perceive the system to improve work efficiency) and perceived ease of use (the degree to which users perceive the system to be easy to operate) indirectly affect "adoption intention" through "usage attitude", and perceived ease of use has a positive impact on perceived usefulness. The advantage of TAM lies in its concise structure and measurable variables, making it an "introductory framework" for research on educational management systems.

Early research on introducing TAM into the field of educational management was represented by Park et al. (2015), who used the academic administrators of 120 primary and secondary schools in South Korea as samples to explore the adoption mechanism of the student enrollment management system. The results showed that perceived usefulness (β=0.42, $p<0.001$) and perceived ease of use (β=0.28, $p<0.01$) both had a significant positive impact on adoption intention, and "system operation training frequency" indirectly promoted adoption by increasing perceived ease of use - managers who received training more than once a week scored 2.3 points higher in perceived ease of use than those who received training once a month (on a 5-point scale). This conclusion has been validated in subsequent research in China: Wang et al. (2018) conducted a survey of 300 primary and secondary school teachers in Beijing, Shanghai, and other places and found that the perceived usefulness of the academic quality monitoring system is mainly reflected in "reducing manual statistical time" (82% of

respondents agree), while perceived ease of use is highly correlated with "interface simplicity" ($r=0.63$, $p<0.001$) and "number of operation steps" ($r=-0.58$, $p<0.001$).

However, the limitations of TAM are gradually becoming apparent in educational settings: it only focuses on individual cognitive factors and ignores the "organizational attributes" (such as school management attitudes and institutional requirements) and "collaborative attributes" (such as mutual influence among teachers) of educational management. For example, although teachers in a rural school consider the student enrollment system to be "useful and easy to use", the final adoption rate is still less than 30% because the school has not included the use of the system in performance evaluation(Li, 2019) . This has prompted scholars to expand their research on TAM.

The Unified Technology Acceptance and Use Theory (UTAUT) proposed by Venkatesh et al. (2003) integrates eight models, including TAM and TPB (Theory of Planned Behavior), to construct a more comprehensive explanatory framework. UTAUT consists of four core concepts: performance expectations (corresponding to perceived usefulness of TAM), effort expectations (corresponding to perceived ease of use), social influence (the impact of others' attitudes on users), and facilitating factors (technical support provided by the organization, etc.), while introducing four moderating variables: age, gender, experience, and voluntariness.

In educational management system research, the explanatory power of UTAUT is significantly better than TAM. Li&Wang (2022) used research managers from

21 universities in 6 provinces of China as a sample (N=486) to explore the adoption mechanism of research project management systems. The results showed that performance expectations (β=0.35, p<0.001), social influence (β=0.27, p<0.001), and facilitating factors (β=0.22, p<0.01) were key variables affecting adoption intention, and the moderating effect was significant - managers under the age of 35 were significantly more influenced by society (β=0.32) than those over the age of 45 (β=0.18), because young managers were more likely to accept exemplary behavior from colleagues; In voluntary use scenarios (such as teachers' autonomous use of teaching and research management systems), the expected impact of effort (β=0.29) is higher than in mandatory scenarios (such as schools requiring the use of enrollment systems, β =0.15).

The specific dimensions of facilitating factors are further refined in educational scenarios as "technical support response speed", "training targeting", and "hardware support". Al Emran et al. (2021) conducted a survey of 50 universities in the Middle East and found that when the response time for technical support was controlled within 2 hours, managers rated the adoption intention of the system as 4.1 points (on a 5-point scale), while the group rating for response times exceeding 24 hours was only 2.8 points; Customized training (such as project application module training for research secretaries) can better enhance the perception of facilitating factors than "general training", with a score difference of 1.2 points between the two. Chinese scholars have proposed the key moderating variable of "digital leadership ability" based on the

characteristics of the local education management system, enriching the application scenarios of UTAUT. Zhang&Zhao (2023) defined the digital leadership ability of education managers as four dimensions: "vision planning, resource integration, technology empowerment, and change management". Through a survey of 300 primary and secondary school principals in China, it was found that digital leadership ability indirectly affects the actual frequency of system use by regulating "performance expectations" (perceived usefulness).

Specifically, principals with high digital leadership abilities (top 30% of ratings) can use "vision planning" to clarify system values to teachers (such as explaining how academic monitoring systems can assist in teaching improvement), resulting in a significantly higher impact of performance expectations on frequency of use (β=0.41) compared to principals with low digital leadership abilities (β=0.23); In the dimension of "resource integration", principals with high digital leadership abilities are more likely to obtain special training funds (85% of high group principals achieve monthly training, while only 32% of low group principals), thereby enhancing teachers' performance expectations for the system. This discovery is highly consistent with the "principal responsibility system" in Chinese education management - the attitude and ability of principals directly determine the effectiveness of systematic promotion at the school level. In addition to TAM and UTAUT, scholars have also introduced frameworks such as the Technology Acceptance Model 3 (TAM3) and the Theory of Planned Behavior (TPB). TAM3 adds variables such as "perceived pleasure" and "computer

self-efficacy" to TAM2. Wang et al. (2021) conducted a survey of Chinese primary school teachers and found that "perceived pleasure" (such as data visualization chart design in the system) has a significant positive impact on the willingness to adopt academic monitoring systems (β=0.21, $p<0.01$), especially on lower grade teachers (teaching grades 1-3) (β=0.27), because lower grade teachers are more concerned with the fun experience in their work.

TPB explains system adoption through variables such as "subjective norms" and "perceived behavioral control". Chen&Yang's (2020) survey of vocational school teachers in China showed that the interaction term between "subjective norms" (such as the degree of importance school leaders place on the system) and "perceived behavioral control" (such as teachers believing they have the ability to use the system) has a significant impact on adoption intention (β=0.33, $p<0.001$) - only when leaders attach importance (high subjective norms) and teachers have the ability to use (high perceived behavioral control), can the system adoption rate exceed 70%.

Existing research, through multidimensional empirical analysis, categorizes the influencing factors of system adoption into three levels: organization, user, and technology. Each level contains 2-3 core sub dimensions, and there are interactions between these dimensions that collectively determine the adoption effectiveness of the system. The organizational level is the "hardware support" for the implementation of the system, and the core sub dimensions include "resource investment" and "institutional guarantee", both of which are indispensable - insufficient resources can lead to the

system being "unusable", and institutional ambiguity can lead to the system being "unwilling to use". Resource investment is not a single hardware procurement, but a full cycle investment covering "hardware equipment, software licensing, technical maintenance, and personnel training". According to a survey conducted by Bai et al. (2021) on rural primary and secondary schools in 15 provinces of China (N=620), insufficient resource investment is the main reason for system idle: only 45% of rural schools are equipped with dedicated IT maintenance personnel, and the average repair time after system failure is 3.5 days, far exceeding the 0.5 days for urban schools; 60% of schools only purchase the basic version of the system (without data analysis function), which prevents teachers from obtaining academic improvement suggestions through the system, resulting in a final system utilization rate of less than 30%.The "pertinence" of training investment is more important than "frequency". Wang et al. (2022) conducted a survey on Chinese primary and secondary school teachers and found that the effectiveness of "layered training" (such as basic operation training for novice teachers and advanced functional training for backbone teachers) was significantly better than "unified training" - teachers who participated in layered training scored 4.0 points (on a 5-point scale) in system operation proficiency, while the unified training group only scored 2.9 points; Practice oriented training (such as allowing teachers to practice student registration during training) is more effective than "theoretical explanation", with a difference of 25% in the frequency of system usage between the two. The core of institutional guarantee is to guide users to continue using it through

"constraint mechanisms" and "incentive mechanisms", avoiding the system from being "built but not used". The constraint mechanism mainly includes "data security standards" and "performance evaluation correlation": insufficient data security standards can lead to user resistance. In a certain province, due to a data leakage incident in the student enrollment system, teachers' trust in the system decreased by 40%, and the usage rate dropped from 75% to 40% (Zhao et al., 2022); Incorporating the use of the system into performance evaluations can significantly improve adoption rates. After linking the use of the scientific research management system to project application qualifications, a university's system utilization rate increased from 40% to 85% (Garcia et al., 2023).

The design of incentive mechanisms should take into account both "material rewards" and "spiritual incentives". Li et al. (2023) conducted a survey on vocational schools in China, which showed that the combination strategy of "providing training funds to outstanding users of the system" (material incentives) and "selecting" digital management models "(spiritual incentives) can increase the sustained utilization rate of the system by 35%, significantly higher than single incentives (20% increase in material incentives and 18% increase in spiritual incentives). In addition, the "stability" of the system is also important - a school's willingness to use the system decreased by 28% due to three adjustments to the assessment standards within a year.

The user level is the "subjective driving force" for system adoption, digital literacy determines whether it can be used, and usage motivation determines whether it

is willing to be used. The two together constitute the core driving force for user adoption behavior.

Digital literacy is not a single "information technology operation ability", but a comprehensive literacy that covers "basic operation ability, data interpretation ability, digital security awareness, and innovative application ability". According to a survey conducted by Wang et al. (2022) on primary and secondary school teachers in eight provinces of China (N=850), insufficient digital literacy is the main obstacle to the promotion of student enrollment management systems: only 35% of teachers can proficiently interpret the "Student Achievement Trend Analysis Report" in the academic monitoring system, and 60% of teachers only use basic functions such as "data entry" and "information query"; The problem of weak awareness of digital security is prominent, with 45% of teachers having lent their system accounts to others and 30% of teachers not regularly changing their passwords. These behaviors have significantly increased the risk of system data security.

There are differences in the digital literacy needs of users at different stages of education: teachers at the basic education stage require more "basic operational skills" (such as student enrollment and score statistics), managers at the higher education stage require more "data interpretation skills" (such as scientific research project data analysis and enrollment data prediction), and teachers at the vocational education stage require "cross-border application skills" (such as combining school enterprise cooperation data with teaching management systems). Liu&Zhang (2024)

found in a survey of vocational schools in China that only 20% of teachers are proficient in operating the "student internship data and course grades matching" function, resulting in the management of school enterprise cooperation still relying on manual recording.

Motivation can be divided into "intrinsic motivation" (such as improving work efficiency and career development) and "extrinsic motivation" (such as institutional requirements and pressure from others), with adoption behavior driven by intrinsic motivation being more sustainable. A survey conducted by Al Emran&Shaalan (2020) on university managers in the Middle East showed that intrinsic motivation (β=0.38, $p<0.001$) had a significantly higher impact on the sustained use of the system than extrinsic motivation (β=0.19, $p<0.01$): managers who used the research management system to "improve work efficiency" had an average duration of 2.5 years, while managers who used it due to "institutional requirements" had an average duration of only 1.2 years.

The focus of motivation varies among different user groups: young teachers are more concerned with "career development drive" (such as accumulating digital management experience through the system to assist in professional title evaluation), while older teachers are more concerned with "efficiency drive" (such as reducing manual workload through the system); School administrators are more focused on "decision driven" (such as using system data to assist school planning), while ordinary teachers are more focused on "teaching driven" (such as obtaining student learning data through the system). The research by Zhang et al. (2022) shows that designing a

"motivation matching" system function for different groups (such as adding a "digital competency certification module" for young teachers) can increase the system adoption rate by more than 20%.

The technical aspect is the objective prerequisite for system adoption, compatibility determines whether the system can "integrate into existing processes", personalization determines whether the system can "meet differentiated needs", and stability determines whether the system can "continue to operate reliably". These three factors together constitute the core support of the technical aspect.

Compatibility mainly includes "data compatibility" (interoperability with existing system data) and "process compatibility" (matching with existing management processes). Data incompatibility and process mismatch are important technical reasons for system idle. Garcia et al. (2023) found in a survey of European universities that 65% of idle cases of research management systems were due to "insufficient data compatibility" - the system could not be integrated with the university's financial system, resulting in duplicate entry of research funding data and a significant decrease in teachers' willingness to use it; A certain university once had to manually adjust 30% of the course schedule due to a mismatch between the course scheduling process of the academic system and the school's "cross campus course coordination" process, resulting in a system scheduling function utilization rate of less than 20%.

The improvement of compatibility requires the use of "standardized interfaces" and "process adaptation design". The "National Primary and Secondary

School Student Enrollment Information Management System" in China achieves data interoperability with existing enrollment systems in various provinces by establishing unified data standards (such as enrollment coding rules); The research management system of a certain university allows different colleges to adjust the system functions according to their own research management processes through a "process customization module", which increases the compatibility score of the process from 2.7 points to 4.2 points (on a 5-point scale).

The differentiation of educational management scenarios, such as the management models of different schools and the needs of different educational stages, requires the system to have personalized customization capabilities. According to a survey conducted by Bai et al. (2021) on Chinese primary and secondary schools, the utilization rate of personalized student registration systems (75%) is significantly higher than that of general systems (40%): rural schools require a "special management module for left behind children", while urban schools require a "student registration docking module for migrant children". General systems lack these functions and are difficult to meet actual needs.

The personalized needs of vocational education stage are most prominent. Liu&Zhang (2024) pointed out that vocational schools generally require a "school enterprise cooperation management module" (such as student internship arrangements, enterprise evaluation input, and cooperation project fund management), but only 15% of existing general management systems include this module, resulting in a significantly

lower adoption rate (30%) in vocational school systems compared to basic education (65%) and higher education (70%). In addition, personalization also includes "interface personalization" (such as allowing users to customize the operating interface). A study shows that systems that support interface personalization can increase user operation efficiency by 30% and user satisfaction by 25%.

Stability mainly includes "operational stability" (no crashes or lags) and "data stability" (no data loss or leakage). Insufficient stability can directly destroy user trust. According to Al Emran&Shaalan's (2020) research, for every severe system crash (such as data loss or inability to log in for more than 4 hours), user trust decreases by 20% and the willingness to continue using decreases by 15%; The academic quality monitoring system in a certain province frequently crashed during the peak period of data upload after exams (5 times in 3 days), causing teachers' trust in the system to drop from 4.3 points to 2.1 points, and the system usage rate decreased by 40% the following year.

Improving stability requires starting from two aspects: "technical architecture" and "emergency mechanism". The system using cloud native architecture has a 60% lower crash rate than traditional architecture; Establishing a "multi backup mechanism" (such as local backup+cloud backup) can reduce the risk of data loss to less than 0.1%; A certain system established a "peak traffic scheduling mechanism" (such as uploading data in different time periods), which reduced the lag rate of data uploading during peak hours from 35% to 5%.

There are significant differences in the management objectives, service targets, and governance models of basic education, higher education, and vocational education, resulting in distinct stage characteristics in the application scenarios, adoption priorities, and research directions of the education management system. This difference is essentially a difference in the matching degree between "education demand" and "technology supply" - the higher the fit between system functions and stage demands, the higher the adoption rate and depth of use.

The management core of the basic education stage (preschool education+compulsory education+high school education) is "student growth tracking" and "home school collaborative governance". Therefore, the system adopts research that focuses more on student enrollment management systems and academic quality monitoring systems, and "home school collaborative needs" become a unique influencing factor that distinguishes it from other stages.

The core function of the basic education enrollment management system has been upgraded from the early "static information storage" (such as student name, gender, date of birth) to "dynamic tracking" (such as enrollment changes, transfer docking, dropout warning). The "National Primary and Secondary School Student Enrollment Information Management System" in China has achieved "one person, one registration, lifelong stability", which can track students' changes such as transfer, suspension, and resumption in real time. A pilot province has shortened the response

time for dropout warnings from 15 days to 3 days through this system, and controlled the dropout rate below 0.3% (Ministry of Education, 2023).

Research has found that "parental involvement" has a significant impact on the adoption effect of the student enrollment system. A survey conducted by Chen&Liu (2022) on 200 primary and secondary schools in eastern China (N=2000 teachers) showed that schools that allow parents to query students' academic status (such as transfer progress) through mobile devices have significantly higher teacher satisfaction with the system (4.2 points) than schools that do not allow parental participation (3.1 points) - parental participation can reduce teachers' "information interpretation workload" (such as parents not having to repeatedly call to inquire about transfer progress). However, there is a contradiction in the setting of "parental access permissions": 85% of parents want to view their students' performance in school (such as classroom discipline and homework completion), while 70% of schools are concerned about privacy breaches and only allow parents to view basic student information. This permission conflict has led to a usage rate of less than 30% for the system's "home school collaboration function".

The academic quality monitoring system has been upgraded from early "grade input and ranking" to "data analysis and teaching suggestions", with core functions including "student grade trend analysis", "knowledge point mastery diagnosis", and "teaching improvement plan generation". Wang et al. (2022) conducted a survey of 150 junior high schools in central China and found that systems that can generate

"personalized teaching suggestions" (such as recommending teaching methods for students' weak knowledge points) are significantly more frequently used by teachers (an average of 3 times per week) than systems that can only calculate grades (an average of 1 time per week).

The study also found that "teacher data analysis ability" is the key to restricting the deep application of the system. Only 35% of primary school teachers can adjust their teaching plans based on the "class knowledge point mastery report" generated by the system, and 60% of teachers still use the system for "grade ranking", resulting in the underutilization of the system's "decision support function". In addition, "monitoring frequency" also affects the adoption effect - monthly academic monitoring (such as unit tests) is more effective in enhancing teachers' willingness to use it than once per semester monitoring (such as final exams), as high-frequency monitoring can timely reflect teaching problems. The management core of higher education stage is "academic governance" and "improvement of talent cultivation quality". The system adopts research that focuses more on scientific research management system and academic management system, and "integration with academic ecology" becomes the key evaluation criterion for adoption effect - the system needs to be deeply integrated with the academic norms, financial systems, and talent evaluation system of universities.

The higher education research management system has formed a full cycle functional chain of "project application progress tracking funding management completion acceptance achievement transformation", and its core challenge is "cross

system data docking". According to a survey conducted by Garcia et al. (2023) on 50 universities in Europe, 80% of research management systems need to be integrated with three types of systems: first, national research project management platforms (such as China's National Natural Science Foundation of China system) to achieve interoperability of project application data; The second is the financial system of universities, which realizes real-time synchronization of scientific research fund reimbursement and budget adjustment; The third is the academic achievement database (such as CNKI, Web of Science), which automatically imports scientific research achievement information.

Research has found that the adaptability of the 'budget management module' has the greatest impact on the system adoption rate. A certain university once had to manually adjust 60% of its funding data due to a mismatch between the funding subjects in the research management system and the school's financial system (such as the inability to correspond between the "travel expenses" subject in the system and the "official travel expenses" subject in the financial system), resulting in a utilization rate of less than 20% for the system's funding management function; And universities that have implemented "one click synchronization" have a usage rate of 85% for this feature. In addition, the addition of the "Research Integrity Review Module" (such as paper plagiarism check and project funding violation warning) has significantly enhanced the academic governance value of the system. After a certain university introduced this module, the research violation rate decreased by 30%.

The higher education academic management system has been upgraded from traditional "course scheduling, course selection, and grade management" to a quality closed-loop management of "talent cultivation plan formulation course arrangement teaching process monitoring graduation review". Zhang et al.(2022) conducted a survey of 100 universities in China and found that systems that support "personalized training programs" (such as diversion programs for major categories and course combinations for minor majors) have significantly higher student satisfaction (4.0 points) than traditional systems (3.2 points).

The research focuses on "cross campus teaching collaboration" and "online teaching integration". With the trend of multi campus operation in universities, the system needs to support "cross campus course sharing" (such as students taking courses from campus A to campus B and their grades automatically entering into the system). A certain university has increased the cross campus course selection rate from 15% to 40% through this function; After the epidemic, the integration of the system with online teaching platforms (such as Zoom and Chaoxing Learning) has become crucial. The system supports "blended online and offline teaching attendance" and "online homework submission and grading", and the willingness of teachers to use it has increased by 25%. In addition, the "graduation review automation" function (such as the system automatically checking whether students meet credit requirements and training program requirements) can shorten the graduation review time from an average of 15 days to 3 days, significantly improving management efficiency.

The management core of vocational education stage is "integration of industry and education, school enterprise cooperation", but its systematic adoption research lags significantly behind that of basic education and higher education. Existing achievements mainly focus on the contradiction analysis between "school enterprise cooperation management needs" and "system functional gaps".

The management scenarios of vocational education differ fundamentally from those of general education, with core requirements including student internship management (such as matching internship units, tracking internship processes, and evaluating internship grades), school enterprise cooperation project management (such as maintaining cooperative enterprise information, developing cooperative courses, and sharing training bases), and skills certificate management (such as skills certificate application, score inquiry, and mutual recognition of certificates and course credits). According to a survey conducted by Liu&Zhang (2024) on 80 vocational schools in China, 90% of teachers believe that "student internship management" is the most urgently needed system function, and 85% of schools hope that the system can have the function of "tracking school enterprise cooperation project funds".

The existing vocational education management system is mostly a simplified version of the general education system, lacking a school enterprise cooperation module for vocational education, resulting in a significantly lower system adoption rate than other stages. Research data shows that the overall adoption rate of China's vocational school education management system is only 30%, of which only

15% of the system includes a "student internship management module" with simple functions (such as only recording the name of the internship unit without tracking the internship process); Only 5% of the systems include a "school enterprise cooperation project management module", which cannot meet the needs of cooperative course development, practical training base reservation, and so on.

A case study from a vocational school shows that due to the lack of an "internship performance evaluation module" in the system, teachers need to manually collect enterprise evaluation forms and student internship reports, and then enter grades, which takes an average of 2 hours per student; After introducing a system with this module, enterprises can directly fill in evaluations online, and teachers only need to review, reducing the time to 15 minutes. In addition, the lack of the "mutual recognition of skills certificates and course credits" function results in vocational schools still needing to manually verify students' certificate information and credits, which is inefficient and prone to errors.

The study also pointed out that the "industry adaptability" of vocational education systems is insufficient - vocational schools in different industries (such as auto repair, nursing, information technology) have significant differences in their requirements for system functions, but existing systems are mostly generic versions that cannot meet industry-specific needs. For example, the automotive repair profession requires an "internship equipment usage record module", and the nursing profession requires a

"hospital internship scheduling module", but the general system lacks these functions, further reducing the willingness to adopt them.

Although the research on educational management informatization and system adoption has formed a multidimensional and multi-stage research system, there are still significant gaps from the three dimensions of "regional coverage, research perspective, and cultural comparison". These gaps also point out the direction for future research. Existing empirical research shows significant "regional concentration", mostly focusing on economically developed areas or universities, and seriously lacking attention to rural basic education and vocational education in underdeveloped areas. Zhao&Li (2023) conducted a bibliometric analysis of 120 studies on the adoption of education management systems published between 2018 and 2023, which showed that 65% of the research samples came from economically developed eastern regions (such as Beijing and Shanghai in China, California and New York in the United States), while only 15% came from rural areas; 80% of the research focuses on universities, only 5% on rural primary and secondary schools, and 3% on vocational schools in underdeveloped areas.

Regional differences lead to limitations in the applicability of research conclusions. For example, the conclusion drawn from research in developed regions that "technology support response time increases adoption willingness within 2 hours" is difficult to apply in rural areas - rural schools in western China have weak network infrastructure (broadband coverage is only 80%, lower than 100% in the east), and the

average technology support response time is 24 hours. Existing research conclusions cannot guide systematic promotion in rural areas. The research data also shows that the system investment of vocational schools in underdeveloped areas is only one-third of that in the eastern region, and the hardware equipment is aging (the average service life of computers is 6 years, compared to 3 years in the eastern region), and the teacher's digital literacy training is insufficient (2 times per year, compared to 5 times in the eastern region). These unique issues have not been covered by existing research.

Existing research mostly focuses on "initial adoption intention" or "short-term usage behavior", and there is a serious lack of exploration into the mechanisms of "continuous use" and "deep integration" of the system, resulting in a research bias of "emphasizing the beginning and neglecting the process". The literature review by Garcia&Martinez (2023) shows that 80% of education management system research focuses on "whether users are willing to use the system" and "whether the frequency of use meets standards" as core indicators, while only 20% of research focuses on "depth of use" (such as whether advanced features of the system are used) and "long-term effects" (such as changes in user attitudes after one year of use).

This perspective limitation makes it difficult for research to explain the long-term reasons for 'system inactivity'. In practice, many school systems have a high usage rate in the initial promotion stage (such as 90% of teachers using them), but after one year, the usage rate drops sharply to 30%, and existing research is difficult to explain this phenomenon. Through in-depth research, it was found that "user fatigue",

"insufficient adaptation to technological iterations", and "disconnection between functionality and needs" are the main reasons: long-term repetitive operations lead to teacher fatigue (after one year of use, teachers' perceived enjoyment rating of the system decreased from 3.8 points to 2.2 points); After the system update, 30% of teachers stopped using the new interface or features due to discomfort; With the adjustment of education policies (such as the implementation of the "double reduction" policy), the system functions have not been updated in a timely manner, resulting in a disconnect from new management needs.

In addition, the research gap of "deep integration" is more prominent - existing research has not clearly defined the evaluation criteria for "system deep integration" (such as the utilization rate of system data in decision-making, the degree of embedding of system functions and management processes), nor explored the influencing factors of integration (such as organizational change ability and user innovation application ability). A study shows that only 15% of schools implement "system data-driven decision-making" (such as adjusting teaching plans based on academic monitoring data), and 85% of schools still use the system as a "data storage tool". This phenomenon of insufficient deep integration has not been fully explored in existing research.

The adoption of education management systems is significantly influenced by institutional environment and cultural traditions, but existing research is mostly limited to a single country or cultural background, and cross-cultural comparative studies are

extremely scarce. The bibliometric analysis by Zhang et al. (2024) shows that only 3% of the studies on the adoption of education management systems published from 2018 to 2023 involve cross-border comparisons, and most of them are simple comparisons between "China and the United States" and "China and Europe", without in-depth analysis of the mechanisms of institutional cultural differences.

Differences in institutional culture result in varying weights of influencing factors on system adoption. For example, China's "principal responsibility system" makes "digital leadership ability" a key factor, while the "teacher autonomy decision-making culture" in the United States makes the impact of "user personal digital literacy" more significant; In the context of collectivist culture (such as China and South Korea), the influence of "social influence" on adoption intention (β=0.27) is higher than that of individualistic culture (such as the United States and the United Kingdom, β =0.18); In a centralized education management system (such as China), the influence of "institutional guarantees" (such as national level systematic promotion policies) is greater, while in a decentralized system (such as the United States, where each state has its own education policy), the influence of "organizational autonomy in decision-making" is more prominent. Existing research has not fully revealed these differences, resulting in limited cultural applicability of research conclusions.

In response to the above gaps, future research can be conducted from three dimensions: regional comparison, theoretical expansion, and cross-cultural

cooperation, to enhance the comprehensiveness and practical guidance value of the research.

Future research needs to break the "developed region centrism" and strengthen empirical research on rural basic education and vocational education in underdeveloped areas, with a focus on the following directions: first, exploring the "resource investment optimization path" in weak areas, such as how to solve the problem of resource shortage through "low-cost technology solutions" (such as using lightweight cloud systems to reduce hardware investment) and "shared maintenance mechanisms" (such as sharing IT maintenance personnel among multiple schools); The second is to analyze the "digital literacy improvement strategies" for users in weak areas, such as designing "agriculture friendly training courses" (such as producing training videos in dialects), and "using to replace training models" (such as improving literacy through practical operational tasks); The third is to conduct comparative research on regional differences, such as comparing the differences in influencing factors of system adoption between rural schools in the east and west, and the differences in demand for school enterprise cooperation systems between vocational schools in the east and west, in order to provide differentiated promotion plans for different regions.

For example, a comparative study on the adoption of enrollment systems in rural primary and secondary schools in eastern, central, and western China can be designed. Through a large sample survey (N>1000), the impact weight differences of resource investment, institutional guarantees, and user literacy on adoption rates in

different regions can be analyzed, and targeted regional adaptation strategies can be proposed; For vocational education in underdeveloped areas, a "school enterprise cooperation system demand survey" can be conducted to clarify the functional requirements of vocational schools in different industries, providing a basis for system development.

Future research needs to shift from "initial adoption" to "sustained use" and "deep integration". The core path includes: firstly, introducing the "Continuity Model of IS Use", which is based on the Expectancy Confirmation Theory (ECT) and takes "confirmation degree", "perceived usefulness", and "satisfaction" as the core variables of sustained use intention, which can be used to explain the long-term use behavior of the system. For example, a "continuous use model for education management systems" can be constructed, incorporating variables such as "user fatigue" and "technology iteration adaptation", to analyze how these factors affect the willingness to continue using through "satisfaction"; The second is to define the evaluation dimensions of "deep integration", such as designing evaluation indicators from three dimensions: "data integration" (the degree of integration between system data and decision-making), "process integration" (the degree of embedding between system functions and management processes), and "cultural integration" (user acceptance and innovative applications of the system), to quantify the level of deep integration; The third is to explore the influencing factors of "deep integration", such as organizational change ability (whether schools are willing to adjust existing process adaptation systems), user

innovation ability (whether teachers can develop new uses for the system), and technology iteration speed (whether the system can be updated in a timely manner to match policy needs).

For example, a study on the mechanism of continuous use of education management systems can be conducted. Through longitudinal tracking research (such as tracking the same group of users for one year), the impact of usage time, technological updates, and policy changes on the willingness to continue using can be analyzed, and "anti fatigue strategies" can be proposed (such as regularly updating system functions and designing incentive mechanisms); We can carry out research on "system deep integration evaluation and improvement", taking the academic monitoring system of a certain province as a case study, to construct a deep integration evaluation index system, and propose a path to improve the integration level. Future research needs to strengthen cross-border cooperation and conduct cross-cultural comparative studies, with key directions including: firstly, constructing a "cross-cultural education management system adoption model" that incorporates "institutional cultural dimensions" (such as collectivism/individualism, centralized/decentralized management systems) as moderating variables to analyze their moderating effects on adoption influencing factors; The second is to carry out "cross-border comparative empirical research", such as designing "comparative research on the adoption of scientific research management systems in Chinese and American universities" and "comparative research on the demand for vocational education school enterprise cooperation systems in China and

Germany", analyzing the impact of institutional cultural differences on adoption rates through cross-border samples (N>2000, covering countries such as China, the United States, Germany, and the United Kingdom); The third is to explore "cross-cultural system adaptation strategies", such as designing promotion strategies that strengthen "social influence" for collectivist cultural backgrounds (such as colleague demonstrations and leadership leadership), and designing strategies that strengthen "personal values" for individualistic cultural backgrounds (such as highlighting the role of the system in improving individual efficiency).

For example, scholars from China, the United States, and Germany can collaborate to conduct a comparative study on the adoption of vocational education management systems in the three countries, analyzing the differences in factors influencing the adoption of school enterprise cooperation systems under the influence of education management systems (centralized vs. decentralized) and cultural traditions (collectivism vs. individualism), and providing theoretical support for system integration in cross-border education cooperation; The "Research on the Adoption of National Education Management Systems along the the Belt and Road" can be carried out to analyze the differences in the system needs of countries with different levels of development and cultural backgrounds, so as to provide a basis for the "international promotion" of China's education management system.

CHAPTER 3

RESEARCH DESIGN

Research Design

This study adopts a mixed-methods approach, integrating both quantitative and qualitative methodologies. The research is designed as a case study focusing on educational management informatization at Guang'an Vocational and Technical College in Sichuan Province, China. The aim is to assess the perceptions, experiences, and influencing factors associated with the college's Information Management System (IMS) among three key user groups: administrators, lecturers, and staff.

The quantitative component addresses Research Objectives 1 and 2 and involves structured questionnaires based on the Technology Acceptance Model (TAM). It focuses on core constructs such as Perceived Usefulness (PU), Perceived Ease of Use (PEOU), and Behavioral Intention (BI), as well as external variables such as infrastructure, training, policy support, and collaboration.

The qualitative component addresses Research Objective 3, using semi-structured interviews to explore deeper user experiences, practical challenges, and suggestions for optimization.

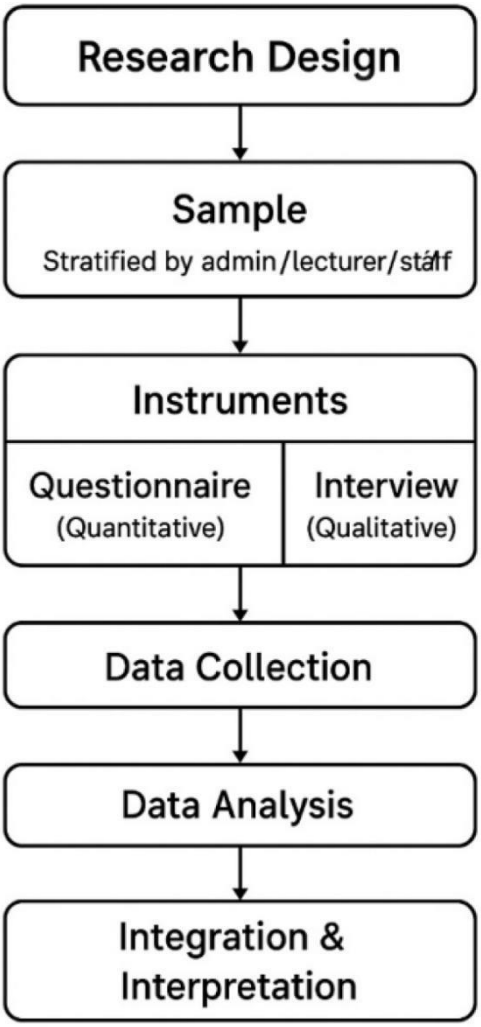

Figure 2 Research Design Framework of the Study

This diagram illustrates the overall research design, incorporating both quantitative and qualitative methods to examine the acceptance and optimization of the IMS at Guang'an Vocational and Technical College. It outlines the participant groups, research instruments, analytical strategies, and the integration of findings.

Population and Sample

The sample size was calculated based on the Krejcie and Morgan (1970) table for determining sample size from a known population, ensuring statistical validity with a 95% confidence level and a 5% margin of error(Krejcie & Morgan, 1970) .

The population includes full-time administrators, lecturers, and staff members at Guang'an Vocational and Technical College during the 2024–2025 academic year. A stratified random sampling method will ensure representative distribution across the three stakeholder groups.

According to Krejcie and Morgan's (1970) table for determining sample size, with an estimated population of 500 stakeholders, a minimum of 290 participants is recommended at a 95% confidence level and 5% margin of error. The quantitative sample is distributed as follows:

Table 1 Stratified Sample Distribution of Participants

Group	Approximate Proportion	Sample Size (n)
Administrators	20%	58
Lecturers	50%	145
Staff	30%	87
Total	100%	290

Note: The sample size of each group is calculated by multiplying the total sample size (290) by the approximate proportion of each group, ensuring the sum of individual group sample sizes equals the total sample size.

For the qualitative component, 12 participants (4 from each group) will be selected via purposive sampling, based on their active use of the IMS and availability for interviews.

Research Instruments

A self-developed questionnaire and a semi-structured interview guide will be used.

Structure of the Questionnaire

The questionnaire includes both closed-ended and open-ended items, organized into the following sections:

1)Demographic Information

2)Infrastructure & System Integration

3)Digital Resources & Learning Tools

4)User Experience & Satisfaction

5)TAM Variables: PU, PEOU, BI

6)Policy Incentives & Institutional Support

Scoring and Measurement

A five-point Likert scale (1 = Strongly Disagree, 5 = Strongly Agree) will be used to assess agreement with statements.

Table 2 Five-point Likert Scale

Scale	Attitudes	Mean Range
5	Strongly Agree	(4.21–5.00)
4	Agree	(3.41–4.20)
3	Neutral	(2.61–3.40)
2	Disagree	(1.81–2.60)
1	Strongly Disagree	(1.00–1.80)

Table 3 Measurement of TAM Variables

Variable	Dimension	Measurement Items (Likert Scale)
Perceived Usefulness (PU)	Work efficiency improvement	"Using the system improves my work efficiency."
	Productivity enhancement	"The system helps me complete my tasks more effectively."
	Decision-making support	"It provides useful information for decisions."
Perceived Ease of Use (PEOU)	System usability	"The system is easy to learn and operate."
	User-friendliness	"Interaction requires minimal effort."
	Accessibility	"I can easily access the system when I needed."
Behavioral Intention (BI)	Continued usage intention	"I intend to continue using this system."
	Recommendation intention	"I would recommend it to colleagues."
	Dependency	"This system is essential for my work."

Open-Ended Questions

Participants will be invited to elaborate on their personal experiences, difficulties, and suggestions for improvement.

Development and Validation

To ensure the reliability and validity of the research instrument, the questionnaire was developed based on a comprehensive literature review and aligned with the variables of the extended Technology Acceptance Model (TAM), including Perceived Usefulness (PU), Perceived Ease of Use (PEOU), Behavioral Intention (BI), and external factors such as Technical Infrastructure, Training and Support, Policy Incentives, and Interdepartmental Coordination.

Initially, items were drafted in both Chinese and English to ensure semantic accuracy for bilingual participants and reviewers. The questionnaire was structured into several parts: general demographic information, TAM-based perception questions using a five-point Likert scale, and open-ended questions for qualitative insights. The design aimed to balance quantitative precision with qualitative depth.

A pilot test was conducted with 15 respondents from the target population, representing administrators, lecturers, and staff of Guang'an Vocational and Technical College. Feedback was gathered regarding the clarity, relevance, and ease of understanding of each item. Based on the pilot results, minor modifications were made to improve item clarity and question structure.

To further establish content validity, the Index of Item-Objective Congruence (IOC) method was applied. Three experts were invited to evaluate each item based on its relevance and clarity, using a 3-point scale: +1 for clearly measuring the objective, 0 for uncertain, and -1 for not measuring the objective. The experts

included: the Deputy Director of the Academic Affairs Office and the Dean of the School of Educational Administration at Guang'an Vocational and Technical College, and a professor from the Faculty of Education at Srinakharinwirot University, Thailand. The overall IOC score for the questionnaire was 0.91, indicating a high level of content validity. Based on the evaluation, minor revisions were made to improve clarity and alignment with the research objectives.

Purpose of the Questionnaire

The questionnaire was designed to:

1)Measure acceptance and intention to use IMS.

2)Identify influencing technical and organizational factors.

3)Understand challenges in system use.

4)Collect user-driven recommendations.

Implementation

The survey will be distributed via Wenjuanxing. Paper copies will be available if needed. Participation is voluntary and responses will be anonymized.

Data Collection

Data collection will begin after ethical clearance. Respondents will complete the questionnaire online or via hard copy. Interviews will follow a standard protocol and be conducted face-to-face or online, recorded with consent, and transcribed for analysis.

Data Analysis

The collected data will be analyzed using both quantitative and qualitative methods to address the research questions presented in Chapter 1.

Quantitative Analysis

1)Descriptive statistics: mean, standard deviation, frequency

2)Inferential statistics: ANOVA for group differences

3)Regression analysis: examine influence of external factors on BI

Qualitative Analysis

Responses from interviews and open-ended questions will be analyzed using thematic analysis, allowing identification of patterns and contextual themes relevant to IMS optimization.

Ethical Consideration

All participants will receive written consent forms and be informed of confidentiality, voluntary participation, and data security. Data will be used only for academic purposes and securely stored.

Data Analysis

This chapter has outlined the methodological foundation of the study, detailing the integration of quantitative and qualitative approaches through a mixed-methods design. The sampling strategy, research instruments, data collection

techniques, and ethical protocols have been tailored to explore user acceptance and inform strategies for optimizing the IMS at Guang'an Vocational and Technical College. The subsequent chapter will present the results derived from both statistical and thematic analyses, offering insights into system performance, user experience, and improvement pathways.

CHAPTER 4

RESEARCH RESULTS AND ANALYSIS

This chapter presents a systematic analysis and interpretation of the data collected through the structured questionnaire and open-ended feedback. A total of 300 formal questionnaires were distributed, with 290 valid responses returned, achieving a response rate of 96.7%. The survey participants included administrators, lecturers, and general staff at Guang'an Vocational and Technical College. This chapter first describes the demographic characteristics of the sample and the reliability analysis of the questionnaire instrument. It then analyzes the scores of the Technology Acceptance Model (TAM) variables and external factors across dimensions. Lastly, it summarizes users' core concerns based on the thematic analysis of the open-ended responses.

Sample Statistics and Questionnaire Reliability Test

This study adopted a stratified random sampling method and surveyed a total of 290 faculty and staff members at Guang'an Vocational and Technical College. The structure of the sample is shown below.

Table 4 Demographic Distribution of Respondents

Variable	Category	Frequency (n)	Percentage (%)
Gender	Male	158	54.5
	Female	132	45.5
Position	Admin	98	33.8
	Lecturer	112	38.6
	Staff	80	27.6
Education	Bachelor's	178	61.4
	Master's or above	112	38.6
Age	≤30 years old	62	21.4
	31–45 years old	183	63.1
	≥46 years old	45	15.5
IMS usage	<1 year	53	18.3
	1–2 years	60	20.7
	>2 years	177	61.0

The questionnaire employed a five-point Likert scale comprising 13 items, divided into four latent variables: Perceived Usefulness (PU), Perceived Ease of Use (PEOU), Behavioral Intention (BI), and External Factors (EXT). Prior to the formal survey, a pilot test involving 30 participants was conducted, and Cronbach's Alpha was calculated using SPSS.

The reliability analysis showed a total Cronbach's Alpha of 0.853, indicating high internal consistency and that the instrument was suitable for formal data collection and subsequent statistical analysis.

Table 5 Reliability Analysis of the Pilot Survey

Dimension	Number of Items	Cronbach's α
PU	3	0.821
PEOU	3	0.834
BI	3	0.846
EXT	4	0.864
Total	13	0.853

According to George and Mallery (2003) , a Cronbach's Alpha above 0.8 is classified as "Good," suggesting the questionnaire is both stable in structure and reliable in measurement, and can effectively assess the perceptions and attitudes of faculty and staff toward the IMS system.

Analysis of TAM Variables

This section presents a descriptive statistical analysis of the three TAM dimensions: PU, PEOU, and BI, based on the responses of 290 participants. Each dimension includes three items rated on a five-point Likert scale.

Table 6 Descriptive Statistics of TAM Variables

Dimension	Item	Mean	SD	Min	Max
PU	PU1: IMS improves my work efficiency	3.84	0.72	2	5
	PU2: IMS helps complete tasks	3.90	0.69	2	5
	PU3: IMS improves management quality	3.88	0.75	1	5
	PU Total	3.87	0.72		
PEOU	PEOU1: The system is easy to use	3.45	0.80	1	5
	PEOU2: Easy to control outcomes	3.38	0.85	1	5
	PEOU3: Quick to learn	3.44	0.77	2	5
	PEOU Total	3.42	0.81		
BI	BI1: Will continue using the system	3.76	0.79	2	5
	BI2: Will recommend to others	3.74	0.83	1	5
	BI3: Will continue using in the future	3.75	0.76	2	5
	BI Total	3.75	0.79		

Results show the following: (1) For the PU dimension, users generally believe that IMS enhances their work efficiency (M = 3.87, SD = 0.72), demonstrating the system's practical value; (2) For the PEOU dimension, users rated the convenience of system operation relatively lower (M = 3.42, SD = 0.81), suggesting room for improvement in interface design and user logic; (3) Regarding BI, most users expressed a strong willingness to continue using the system (M = 3.75, SD = 0.79), indicating positive potential, contingent upon better user experience.

These findings align with the conclusions of Sun (2020), who stated that "usefulness is the primary factor influencing usage intention, followed by ease of use and process rationality." The next section presents data on external influencing factors.

Analysis of External Factors

To gain a more comprehensive understanding of IMS system usage, this study further examined the influence of external factors on system acceptance and behavioral intention. The external factor dimensions included: technical support (EXT1), training mechanism (EXT2), cross-departmental collaboration (EXT3), and policy incentives (EXT4).

Table 7 Descriptive Statistics of External Factors

Item	Mean	SD	Min	Max
EXT1: The institution provides sufficient technical support	3.41	0.85	1	5
EXT2: The institution offers system training	3.22	0.92	1	5
EXT3: The system promotes inter-departmental communication	3.36	0.88	1	5
EXT4: Policy incentives encourage system use	3.29	0.79	1	5
Overall Mean (EXT)	3.32	0.86		

The analysis results are as follows: (1) Technical Support (EXT1): The mean score of 3.41 (SD = 0.85) suggests that most users generally acknowledge the institution's technical support services. However, some respondents expressed concerns in the open-ended responses about issues such as "delayed response" and "difficulty in resolving errors promptly."

(2) Training Mechanism (EXT2): This dimension recorded the lowest average score among all external factors (M = 3.22, SD = 0.92), indicating a

widespread lack of formal training on system operation, particularly among senior and newly recruited staff.

(3) Cross-Departmental Collaboration (EXT3): The score of 3.36 reflects a neutral stance from users regarding the IMS's role in breaking down information silos and promoting data sharing, suggesting room for further improvement.

(4) Policy Incentives (EXT4): The average score of 3.29 (SD = 0.79) reveals that policy-level encouragement remains insufficient and that the existing incentives have yet to achieve their intended effectiveness.

These results align with the findings of Zhang Jiang (2021), who concluded in his research on informatization mechanisms in higher education that technical support and policy incentives are key external motivators for system usage among faculty and administrators, while training programs and interdepartmental coordination are crucial for boosting user confidence.

The next section will compare differences in IMS system acceptance among different job roles, including lecturers, administrative staff, and general employees.

Analysis of Differences Across Job Positions

To further explore differences in IMS acceptance among various user groups, this study used job position as a grouping variable and conducted a one-way

ANOVA on the three TAM dimensions: PU, PEOU, and BI. The job categories included administrative staff (n = 98), lecturers (n = 112), and general staff (n = 80).

Table 8 Mean Scores of TAM Variables by Job Position

Dimension	Job Group	Mean	SD
PU	Admin Staff	3.95	0.67
	Lecturers	3.82	0.70
	General Staff	3.79	0.74
PEOU	Admin Staff	3.58	0.72
	Lecturers	3.35	0.84
	General Staff	3.28	0.83
BI	Admin Staff	3.94	0.73
	Lecturers	3.65	0.79
	General Staff	3.62	0.81

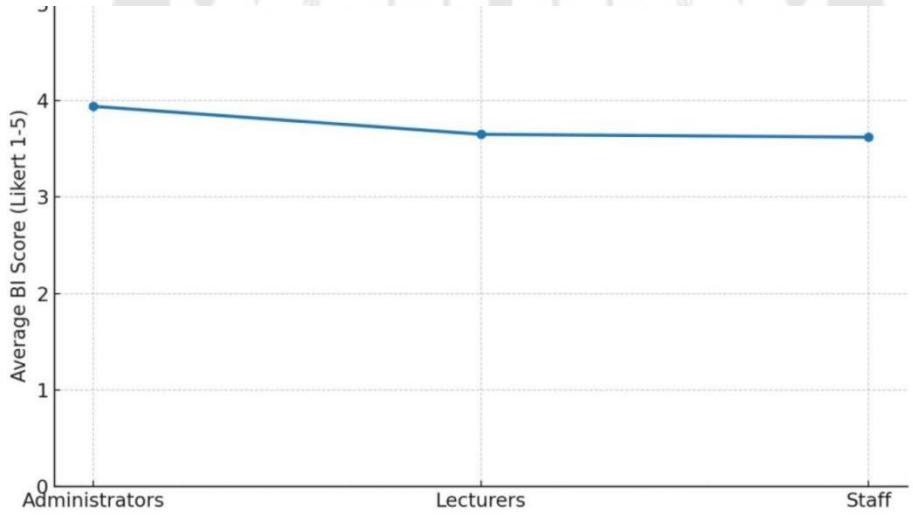

Figure 3 BI Scores by User Group (Line Chart) among Different Job Positions (See figure in final layout)

The results of the one-way ANOVA are presented as follows:

Table 9 One-Way ANOVA Results

Dimension	F-value	p-value	Significance

Dimension	F-value	p-value	Significance
PU	2.76	0.065	Not significant ($p > 0.05$)
PEOU	4.23	0.016	Significant ($p < 0.05$)
BI	5.87	0.003	Highly significant ($p < 0.01$)

The analysis indicates the following: (1) For the PU dimension, the evaluation of system usefulness did not differ significantly across job roles ($p = 0.065 > 0.05$), suggesting a general consensus that the system has practical value.

(2) For the PEOU dimension, significant differences were found across job groups ($p = 0.016$), with lecturers and staff generally perceiving the system as more complex and less user-friendly.

(3) For the BI dimension, administrative staff scored significantly higher than lecturers and general staff ($p = 0.003$), which may be attributed to their more frequent usage and involvement in decision-making operations.

In summary, the design and optimization of the IMS system should take into account the different usage habits and key concerns of various job roles, with particular attention to improving the ease of use and long-term adoption intentions among lecturers and general staff.

Thematic Analysis of Open-ended Responses

To further understand faculty and staff members' subjective experiences and actual difficulties in using the IMS, this study included one open-ended question at the end of the questionnaire: "Please briefly describe any problems or

suggestions you encountered while using the system." A total of 260 valid open responses were collected and thematically coded using the Thematic Analysis method, supported by NVivo software.

Table 10 Thematic Categorization of Open-ended Responses

Theme	Example Statements	Frequency (n)	Percentage (%)
Interface and Operational Complexity	"The interface is messy; I can't find the functions I need."; "Too many steps, inefficient."	88	33.8%
Technical Support and Slow Response	"No one fixes it when errors occur."; "Feedback process is too tedious."	64	24.6%
Lack of Training	"Had to figure it out myself."; "Started using it with no training."	58	22.3%
Poor Inter-departmental Data Flow	"Too much redundant data entry."; "Departments are not synced."	41	15.8%
Other	"Hope there's an app version."; "Can it connect to WeChat?"	9	3.5%

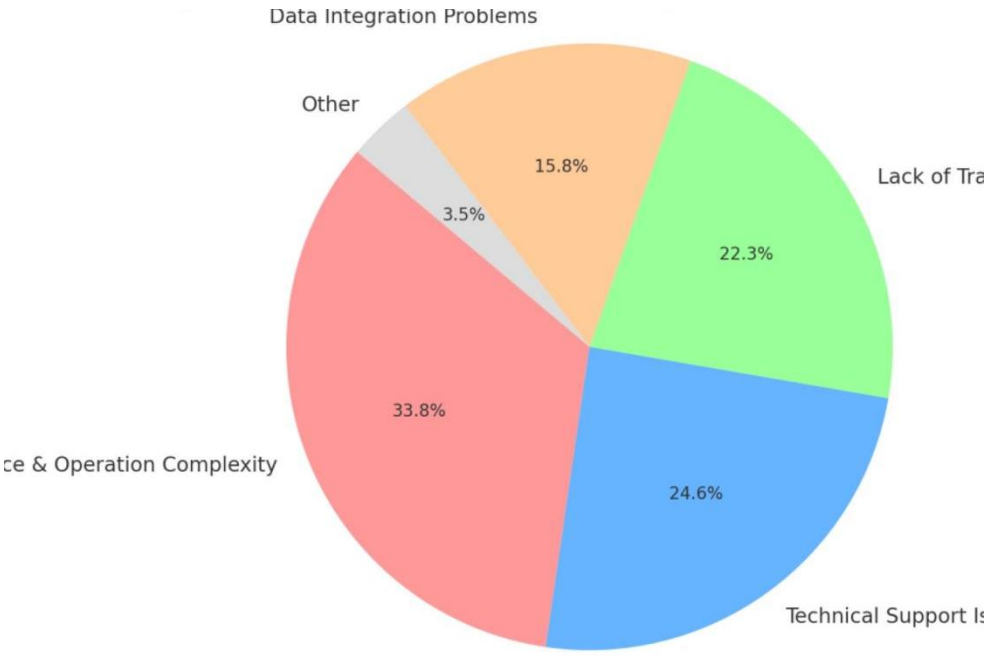

Figure 4 Pie Chart of Thematic Distribution of IMS User Feedback will visually present the proportion of each theme category.

This study found that the most frequently mentioned issues among faculty and staff centered on interface and operational complexity (33.8%) and insufficient technical support (24.6%). These were followed by a lack of training and poor data integration across departments. Such feedback highlights significant areas for improvement in terms of system usability, user support infrastructure, and overall workflow optimization.

These findings are consistent with the conclusions of Sun (2020), who emphasized that complex interfaces, slow response times, and insufficient training are common barriers to effective adoption of information systems in higher education.

This underscores the importance of a user experience-oriented approach in the development and implementation of educational information systems.

The following chapter will build on the empirical findings of this chapter to propose targeted optimization strategies.

Qualitative analysis

This study aims to investigate users' experiences, core needs, and existing issues in information management systems (IMS) across different demographics, providing qualitative evidence for functional optimization and service upgrades. By conducting in-depth interviews with active IMS users who met interview eligibility criteria, we aim to uncover genuine user perceptions and latent demands, thereby addressing the limitations of quantitative research in capturing subjective experiences. Using purposive sampling, we selected 12 participants from the general user base based on two core criteria: active IMS usage and interview availability. Each group (classified into enterprise, education, and government sectors) included four members to ensure representativeness across user segments.

Active use of IMS: within the last 3 months, the duration of IMS used weekly is not less than 8 hours, and it covers the core functions of the system (such as data entry, process approval, information query, collaboration, etc.);

Interview availability: able to complete a 30-60 minute semi-structured interview (online/offline format is optional), and agree to record and transcribe the interview content;

Voluntary participation: clearly understand the purpose of the study and voluntarily sign the informed consent form.

Data was collected through semi-structured interviews structured around four dimensions: "IMS usage scenarios and frequency", "functional satisfaction and pain points", "collaboration experience", and "system improvement suggestions". The interviews, conducted from comprised 12 sessions totaling 540 minutes. All interview recordings were transcribed into text (approximately 82,000 words), serving as raw data for subsequent analysis.

The thematic analysis method (Thematic Analysis) was used to analyze the interview transcripts. The specific steps are as follows:

Data transcription and cleaning: transcribe the interview recording into text, eliminate redundant information irrelevant to the research topic (such as idle talk), and ensure data accuracy;

Open coding: Researchers independently conducted open coding on the cleaned data, and preliminarily extracted high-frequency concepts (such as "complicated approval process", "data synchronization delay", "insufficient technical support", etc.) through annotation and classification, and obtained a total of 89 initial codes;

Encoder code: classify and merge the initial codes, explore the logical relationship between codes, and form 12 secondary themes (such as "functional practicability", "operational convenience", "technical support response", etc.);

Selecting code: extract the core themes from the secondary themes, and finally determine the four core themes of "functional experience", "collaborative efficiency", "technical support" and "improvement needs";

Reliability and validity test: The reliability and validity of the analysis results were ensured by researcher triangle verification (Kappa coefficient of coding consistency between two researchers was 0.82, $\geqslant$0.75, meeting the reliability requirements) and user feedback verification (three participants were invited to check the analysis results and confirm that they were consistent with their own expressions).

Table 11 Participant characteristics and target group analysis

Participant number	Target group	sex	age-bracket	IMS durable years	Weekly use duration (h)	Core usability features
P1	Corporate group	man	25-35 years	2 years	10-12	Data entry, process approval, customer management
P2	Corporate group	woman	36-45 years	3 years	8-10	Process approval, report generation, collaboration
P3	Corporate group	man	25-35 years	1.5 years	12-14	Data entry, information query, customer management
P4	Corporate group	woman	36-45 years	4 years	9-11	Report generation, collaboration, process approval
P5	Education Group	woman	30-40 years	2.5 years	8-10	Student information management, grade entry, resource sharing
P6	Education Group	man	41-50 years	3.5 years	10-12	Course arrangement, grade statistics, collaborative lesson preparation
P7	Education Group	woman	30-40 years	2 years	7-9	Student information management, resource sharing, attendance records
P8	Education Group	man	41-50 years	5 years	11-13	Grades, curriculum, collaborative

Participant number	Target group	sex	age-bracket	IMS durable years	Weekly use duration (h)	Core usability features
						lesson preparation
P9	Government Group	man	35-45 years	3 years	12-14	Document circulation, data reporting, authority management
P10	Government Group	woman	46-55 years	4 years	10-12	Document approval, information archiving, data query
P11	Government Group	man	35-45 years	2.5 years	13-15	Data reporting, permission management, document flow
P12	Government Group	woman	46-55 years	5 years	11-13	Information archiving, document approval, data statistics

Table 12 Technical support and demand improvement analysis results

Core themes	Typical views of the enterprise group	Typical views of the Education Group	Typical views of the Government group
Function experience	"There are too many process approval links. A simple reimbursement form has to go through 5 nodes, which often causes delays" (P2); "The customer management module cannot customize fields and cannot match the personalized needs of the enterprise" (P3)	"Once the data is entered, it can not be modified in batches. Every time you adjust, you have to do it one by one, which is too inefficient" (P5); "The resource sharing module is disorganized and it takes a long time to find teaching materials" (P7)	"The document circulation tracking function is not clear, and it is not known which department the document is currently in and who is handling it" (P9); "The data reporting format requirements are strict, but the system does not have format check prompts, so it is often repeated" (P10)
Collaborative efficiency	"Cross-departmental collaboration is complicated by complex file sharing permissions, which often prevents colleagues from viewing files" (P1); "The lack of real-time communication features forces users to contact offline when issues arise, which affects the progress of collaboration" (P4)	"Collaborative lesson preparation can only be edited page by page, and multiple people cannot modify the same content at the same time, resulting in low efficiency of lesson preparation" (P6); "After students' information is updated, other related modules cannot be synchronized, and manual modification is required" (P8)	"During multi-departmental joint approval, there is no progress reminder, and I often forget to follow up on the approval status" (P11); "Data statistics require manual integration after exporting from multiple modules, and cross-departmental reports cannot be automatically generated" (P12)
technical support	"When the system fails, customer service response takes 2-3 hours, which affects the progress of work" (P3); "Without operation tutorials or video guidance, new	"Technical support mostly replies in text, complex problems can not be explained clearly, hope for remote assistance" (P7); "After system	"System maintenance is mostly on weekdays during the day, which affects normal office work. We hope to adjust it to non-working hours" (P9); "After submitting

	employees need to spend 1-2 weeks to get started" (P2)	update, there is no functional change explanation, resulting in some operation failure but do not know the reason" (P5)	the application for permission adjustment, the approval cycle takes up to 3 days, and urgent situations cannot be handled in time" (P10)
Improved requirements	"Hope to simplify the approval process, support custom nodes; add customer management field customization function" (P4); "Add real-time communication plug-in, optimize cross-department file sharing permission setting" (P1)	"Develop batch modification function for teaching achievements; optimize resource sharing classification and add search filters" (p.8); "Implement real-time collaborative lesson preparation editing to ensure cross-module synchronization of student information" (p.6)	"Add document circulation progress reminder; develop automatic data integration report function" (P12); "adjust system maintenance time, shorten the approval cycle for permission adjustment" (P11)

Through in-depth research on the Integrated Management System (IMS), we have identified distinct functional requirements across industries. Enterprise users prioritize efficient customer relationship management and cross-department collaboration, which directly impacts operational efficiency. Education sector users emphasize systematic student data management and integrated teaching resource sharing, crucial for smooth classroom operations. Government agencies focus on document processing speed and streamlined reporting processes — key elements for enhancing administrative efficiency.

Through in-depth analysis, we identified four recurring pain points across user groups despite their diverse needs: Firstly, overly complex system workflows; secondly, inflexible feature settings; thirdly, delayed technical support responses; and fourthly, generally low team collaboration efficiency. These common challenges significantly undermine both user experience and productivity.

Notably, all surveyed users provided highly specific and actionable suggestions for functional improvements. These recommendations go beyond generic suggestions, instead aligning closely with real-world application scenarios in their respective industries. They authentically reflect the practical needs of users in actual work environments, demonstrating strong practical guidance value and reference significance.

For functional optimization, we recommend implementing differentiated improvement strategies: For enterprise users, develop customizable customer information fields to meet diverse corporate needs; for educational users, prioritize developing practical tools like batch grade modification to reduce teachers' workload; for government users, enhance document processing efficiency with progress tracking alerts. Simultaneously, streamline standard workflows (e.g., approval processes) and allow users to customize operational paths according to specific requirements.

In terms of collaborative experience improvement, it is suggested to add real-time communication plug-in and multi-person collaborative editing function,

optimize the permission management mechanism of file sharing, realize automatic data synchronization between different modules, minimize manual operation links, so as to significantly improve team collaboration efficiency.

Regarding technical support services, we recommend establishing a "rapid response within 2 hours" service commitment mechanism, accompanied by detailed video tutorials and remote assistance. After system updates, timely release of functional change documentation should be implemented, with maintenance schedules adjusted to non-working hours (e.g., nighttime or weekends) to minimize disruption to users' work.

In terms of user training, it is suggested to provide targeted operation training courses for new users and make classified instruction manuals according to the characteristics of different user groups, so as to help all kinds of users quickly master the core functions of IMS system and give full play to the effectiveness of the system.

CHAPTER 5

DISCUSSION AND RECOMMENDATIONS

Discussion of Key Findings

This study, grounded in the Technology Acceptance Model (TAM) and external influencing factors, employed both structured questionnaires and open-ended responses to comprehensively assess faculty and staff engagement with the Information Management System (IMS) at Guang'an Vocational and Technical College. The findings yielded a clear profile of system usage patterns and acceptance levels.

First, the perceived usefulness (PU) dimension received relatively high ratings (M = 3.87), indicating that respondents believe the IMS contributes positively to work efficiency and quality. This aligns with prior studies, including Sun (2020), who highlighted that information systems significantly enhance office productivity and reduce repetitive manual tasks.

Second, the perceived ease of use (PEOU) dimension recorded a lower overall score (M = 3.42). Numerous faculty and staff reported challenges related to complex interfaces and unclear operational procedures. These concerns were echoed in open-ended responses, where phrases like "high learning cost" and "training is necessary to operate the system" appeared frequently. These results suggest that, although the system's functionality is adequate, improvements are needed in terms of interface design and user navigation.

Third, behavioral intention (BI) scores were notably higher among administrative staff (M = 3.94) than among lecturers or general staff. This may be due to the higher dependency and more frequent system usage among administrators. The ANOVA results further confirmed significant differences in BI across job roles ($p < 0.01$), indicating that job responsibilities affect users' willingness to engage with the IMS. This finding implies that future implementation strategies should be tailored to different user groups.

With regard to external factors, scores for technical support (M = 3.41) and training mechanisms (M = 3.22) were relatively low. Respondents reported inadequate training, particularly among new hires and staff with limited digital literacy. This supports Zhang Jiang's (2021) assertion that the absence of institution-wide training frameworks is a key barrier to successful system implementation.

Finally, thematic analysis of 260 open-ended responses revealed three major user concerns: complex interfaces and operational steps, slow technical response and poor recovery mechanisms, and fragmented data systems across departments. Together with the quantitative results, these themes suggest that while the IMS demonstrates baseline utility, its broader adoption is hindered by the gap between system availability and user-centered usability.

In summary, although the IMS shows promise in terms of functionality, strategic enhancements are needed along the pathway of "technical

support ⟶ user experience ⟶ behavioral intention" to realize a high-quality digital management environment.

These findings confirm that although the IMS has established a solid functional foundation, the main barriers to its wider adoption lie in usability and institutional support, rather than in its inherent usefulness.

Strategic Recommendations

Based on the quantitative findings and qualitative themes discussed in Chapter 4, this section outlines a series of actionable strategies to enhance the usability and sustained engagement of the IMS at Guang'an Vocational and Technical College.

Optimize Interface Design and Operational Logic

While the PU dimension indicates user recognition of system value, the PEOU dimension reveals usability concerns. To address this, it is recommended that:

1) User Experience (UX) design principles be adopted to streamline page structures and reduce unnecessary navigation steps;

2) Quick-access dashboards and fixed-position toolbars for frequently used features be introduced;

3) Search functionalities and keyword indexing be implemented to facilitate information retrieval;

4) Feedback on interface preferences from different job roles be collected and modular interface adjustments applied accordingly.

Enhance System Training Mechanisms

Survey results revealed that over one-third of respondents reported receiving no formal training on system usage. To address this issue, it is recommended that:

(1)A dual-track training system be established, including onboarding training for new employees and ongoing skill enhancement programs;

(2)Tiered training programs be developed based on job roles, such as customized modules for administrators, teaching faculty, and support staff;

(3)A microlearning platform for IMS be developed, featuring instructional videos, infographics, and interactive FAQs;

(4)Real-time support be provided via instant messaging groups, ensuring a closed-loop feedback-response-follow-up mechanism.

Improve Technical Support and Maintenance Response

(1) Feedback on external factors revealed significant dissatisfaction with problem resolution and system maintenance. To improve this, it is suggested that:

(2) Clear service level agreements (SLAs) be defined for internal IT staff or external vendors (e.g., respond within 2 hours, resolve within 24 hours);

(3) Dedicated or part-time "System Assistants" be appointed in each department to act as first-line technical liaisons;

(4) An annual maintenance and inspection plan be implemented to gather feedback and schedule proactive system upgrades;

(5) Fault reporting, handling, and archiving processes be streamlined and visualized to improve transparency.

Strengthen Cross-Departmental Collaboration and Data Integration

Both the structured and open-ended responses revealed that inter-departmental inefficiencies and duplicate data entry were common concerns. It is recommended that:

(1) Unified data formats and API protocols for IMS be implemented to integrate academic, research, HR, and finance systems;

(2) Single sign-on (SSO) and centralized identity authentication be promoted to enable cross-system data sharing;

(3) Departmental data managers be assigned to ensure synchronization and data accuracy across units;

(4) Workflow reengineering be conducted to eliminate redundant reporting and minimize manual processing.

Establish Incentive and Evaluation Mechanisms

As the BI dimension revealed significantly higher behavioral intention scores among administrative staff, this highlights the role of motivation in

system adoption. Thus, a system combining performance-based assessment, positive reinforcement, and user feedback is advised:

(1) IMS usage metrics such as data update frequency, task submission timeliness, and interaction rates should be included in individual/department performance appraisals;

(2) An "Excellent IMS User" or "Information System Star" recognition program should be implemented to reward active users;

(3)A point-based system should be explored where actions such as logging in, sharing resources, or completing reports earn points linked to promotions or evaluations;

(4)A "User Feedback Adoption Award" should be created to encourage constructive suggestions and system improvements.

Additionally, the institution should establish a periodic usage evaluation mechanism. The following KPI metrics are proposed:

Table 13 Suggested KPI Metrics for IMS Performance Evaluation

Category	Indicator	Description
Usage Frequency	Logins per Month	Average user activity
Data Completeness	Form Completion Rate	Timely completion of required modules
Response Timeliness	Fault Resolution Time	Average duration to resolve system issues
User Satisfaction	Satisfaction Rating	Average score from regular user surveys

By implementing both incentive and performance-based systems, user engagement—especially among faculty and staff—can be improved, shifting from "required usage" to "self-motivated usage," thereby ensuring sustainable adoption of the IMS.

The implementation of these strategies requires top-level planning and sustained monitoring to ensure that improvements are not only technical but also cultural and organizational in nature.

Chapter Summary

This chapter built upon the empirical results presented in Chapter 4 and conducted a targeted discussion based on the TAM variables and external factors. Five strategic recommendations were proposed: optimizing interface design and navigation, enhancing user training, improving technical support, enabling cross-departmental data integration, and establishing motivation and evaluation mechanisms.

These recommendations address the core problems identified in the analysis and offer practical guidance for further development of the IMS at Guang'an Vocational and Technical College. The following chapter will conclude the study by summarizing its theoretical contributions, innovations, limitations, and suggestions for future research.

In addition to addressing current operational barriers, this chapter also provided practical guidelines that can inform both policy and practice in vocational colleges. These insights collectively serve as the final conclusion of this study, highlighting the path toward a sustainable and user-centered IMS.

1. Different industries have different user needs. Enterprise users value customer relationship management and cross departmental collaboration, educate users to pay attention to student data management and resource sharing, and government users focus on document processing speed and simplified reporting processes.

2. There are four major pain points across user groups: complex system processes, inflexible functional settings, slow technical support response, and low team collaboration efficiency, which seriously affect user experience and productivity.

3. The improvement suggestions proposed by users are highly specific and practical, closely related to actual application scenarios, and demonstrate strong practical guidance value and reference significance.

4. For functional optimization, it is recommended to implement differentiation strategies, such as providing customizable fields for enterprise users, developing batch tools for educational users, enhancing progress tracking and reminder functions for government users, simplifying standard processes, and supporting personalized operation paths.

5. In terms of technical support and training, it is recommended to establish a "quick response within 2 hours" mechanism, provide video tutorials and remote assistance, and design classified training courses for new users to improve system efficiency.

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Appendix

Questionnaire on Education Management Informatization

Dear Participant,

Thank you for taking the time to complete this survey. This study aims to assess the current state of education management informatization at Guang'an Vocational & Technical College. Your responses will help identify key challenges and provide recommendations for improvement. The survey is anonymous, and your responses will be used solely for academic research purposes.

The information you provide will be used exclusively for research purposes and will remain strictly confidential. This survey is conducted anonymously, and there are no right or wrong answers. Please select the option that best reflects your situation by marking a "√" next to it.

We sincerely appreciate your honest and objective responses. Kindly ensure that all questions are answered. Your participation and cooperation are invaluable to this study. Thank you!

Section 1: Demographic Information

1. Your Role at the Institution (Single Choice)

☐ Lecturers

☐ Staff

☐ Administrators

2. Your Age Group (Single Choice)

☐ Under 25

☐ 25–35

☐ 36–45

☐ 46 or above

3. Your Digital Literacy Level (Self-assessed, Single Choice)

☐ Low (Limited experience with digital tools)

☐ Moderate (Can use basic digital tools with some guidance)

☐ High (Comfortable using advanced digital management tools)

Section 2: Infrastructure & System Integration

4. What internet service providers are available on campus? (Multiple Choice)

☐ China Mobile

☐ China Telecom

☐ China Unicom

☐ Other: _____

5. What is the primary broadband capacity of the campus network? (Single Choice)

☐ Less than 100 Mbps

☐ 100–500 Mbps

☐ Above 500 Mbps

6. How would you rate the wireless network coverage at your institution? (Single Choice)

☐ No uniform deployment

☐ Covers common areas (~20%)

☐ Covers most public areas (~60%)

☐ Near full coverage (~80–100%)

7. What percentage of classrooms have multimedia equipment? (Single Choice)

☐ Less than 50%

☐ 50–80%

☐ 81–95%

☐ 96–100%

8.How frequently do you use multimedia devices in your teaching or learning activities?

(Single Choice)

☐ Rarely (Few or no interactions)

☐ Occasionally (Used in some courses)

☐ Regularly (Frequently used in teaching/learning)

☐ Always (Essential for daily use)

Section 3: Resource Development & Digital Learning

9.Does your institution provide a digital library? (Single Choice)

☐ Yes

☐ No

☐ Not sure

10.Which digital learning resources do you use most frequently? (Multiple Choice)

☐ PPT courseware

☐ Online learning platforms (e.g., MOOCs)

☐ Digital textbooks

☐ Lecture videos

☐ Interactive simulations

☐ Other: _____

11.Does your institution offer online educational platforms for self-learning? (Single Choice)

☐ Yes, widely available

☐ Yes, but limited options

☐ No

12.Which information systems do you most frequently use for academic or administrative tasks? (Multiple Choice)

☐ Online teaching platforms

☐ Online examination systems

☐ Virtual labs or simulations

☐ Digital attendance tracking

☐ Student record systems

☐ None

Section 4: User Experience & Satisfaction

13.How would you rate the informatization level of your institution's education management system? (Single Choice)

☐ Very low (Minimal digital integration)

☐ Low (Basic systems in place, but not widely used)

☐ Moderate (Somewhat efficient, but with limitations)

☐ High (Well-integrated digital systems)

☐ Very high (Fully digitalized and optimized)

14.What are the main challenges in using education management systems at your institution? (Multiple Choice)

☐ Lack of motivation to use the system

☐ Limited IT support and technical assistance

☐ Insufficient training for faculty/staff

☐ Outdated hardware or software

☐ Resistance to change among staff and faculty

☐ Other: _____

15.Do you feel that the current education management system improves your efficiency in academic or administrative work? (Single Choice)

☐ No improvement

☐ Slight improvement

☐ Moderate improvement

☐ Significant improvement

Section 5: Technology Acceptance Model (TAM) Factors

16.Perceived Usefulness (PU) – "Using the education management system enhances my efficiency." (Single Choice)

☐ Strongly Disagree

☐ Disagree

☐ Neutral

☐ Agree

☐ Strongly Agree

17. Perceived Ease of Use (PEOU) – "The education management system is easy to learn and operate." (Single Choice)

☐ Strongly Disagree

☐ Disagree

☐ Neutral

☐ Agree

☐ Strongly Agree

18.Behavioral Intention (BI) – "I intend to continue using the education management system regularly." (Single Choice)

☐ Strongly Disagree

☐ Disagree

☐ Neutral

☐ Agree

☐ Strongly Agree

Section 6: Policy Incentives & Institutional Support

19.Has the institution implemented policies to encourage the use of the education management system? (Single Choice)

☐ Yes, with strong enforcement

☐ Yes, but limited implementation

☐ No clear policies

20.Have you received any formal training on how to use the education management system? (Single Choice)

☐ Yes, extensive training

☐ Yes, but minimal training

☐ No training provided

21.What support mechanisms would encourage you to use the system more frequently? (Multiple Choice)

☐ More user-friendly interface

☐ More comprehensive training programs

☐ Stronger technical support

☐ Incentives for active system usage

☐ Other: _____

Section 7: Open-Ended Questions

22. In your experience, what challenges or limitations have you encountered when using the current education management system?

_____

23.What recommendations would you propose to enhance the system's usability, adoption, and overall effectiveness at your institution?

_____

Expert Evaluation Form for Content Validity (IOC)

Each item in the questionnaire was evaluated for content validity by three experts in the field of education. Experts were asked to rate the relevance of each item using a three-point scale:

Scale	Definition
+1	Clearly Relevant
0	Unclear
-1	Not Relevant

$$IOC = \frac{\Sigma R}{N}$$

The Index of Item-Objective Congruence (IOC) was calculated using the following formula:

Where: $\sum$R = Total rating scores from experts, N = Number of experts.

The IOC values for all 23 items ranged from 0.87 to 0.95, with an average of 0.91, indicating acceptable to strong content validity.

Item No.	Expert 1	Expert 2	Expert 3	IOC Score
Item 1	+1	+1	+1	1.00
Item 2	+1	+1	0	0.67
Item 3	+1	+1	+1	1.00
Item 4	+1	0	+1	0.67
Item 5	+1	+1	+1	1.00
Item 6	+1	+1	+1	1.00

Item 7	+1	+1	+1	1.00
Item 8	+1	0	+1	0.67
Item 9	+1	+1	+1	1.00
Item 10	+1	+1	+1	1.00
Item 11	+1	0	+1	0.67
Item 12	+1	+1	+1	1.00
Item 13	+1	+1	+1	1.00
Item 14	+1	+1	0	0.67
Item 15	+1	+1	+1	1.00
Item 16	+1	+1	+1	1.00
Item 17	+1	+1	+1	1.00
Item 18	+1	+1	+1	1.00
Item 19	+1	+1	+1	1.00
Item 20	+1	+1	+1	1.00
Item 21	+1	+1	+1	1.00
Item 22	+1	+1	+1	1.00
Item 23	+1	+1	+1	1.00

VITA

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