

THE IMPACT OF EDUCATION MANAGEMENT INFORMATIZATION ON THE ADMINISTRATIVE EFFICIENCY OF S UNIVERSITIES IN YUNNAN PROVINCE, CHINA

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Abstract

This paper aims to study 1) the impact of the infrastructure of Education Management Informatization on the Administrative Efficiency of universities, 2) the impact of Applied Information Management of Education Management Informatization on the Administrative Efficiency of universities, and 3) the impact of Teachers' Information Literacy of Education Management Informatization on the Administrative Efficiency of universities. The study employs a quantitative research methodology, utilizing survey questionnaires to collect data. The research subjects are teachers at S University in Yunnan Province, China. The sample size was determined using the Taro Yamane formula, with 264 teachers selected (out of a total of 680 teachers at S University in Yunnan Province, China). Data analysis was conducted using statistical software methods, including reliability analysis, validity analysis, descriptive analysis, correlation analysis, and regression analysis. The results show that 1) the infrastructure of education management informatization has a positive impact on the administrative efficiency of universities; 2) the application of information management in education management informatization has a positive impact on the administrative efficiency of universities; and 3) teachers' information literacy in education management informatization has a positive impact on the administrative efficiency of universities. This study provides a basis for improving the administrative efficiency of universities and enriches the relevant theories of education informatization and administrative efficiency.

Keywords: Education management informatization, Administrative efficiency of universities

Introduction

In the 1990s, the development of information technology became a major trend in global education. China explicitly recognized the revolutionary role of information technology in education, particularly in the field of higher education, in the National Medium-and Long-Term Education Reform and Development Plan (2010–2020) and the Ten-Year Plan for Education Informatization (2010–2020). With the expansion of universities, the existing administrative management model has gradually become unable to meet development needs, and informatization of administrative management has become the key to improving management efficiency. Informatization can improve the scientific nature and efficiency of university administrative management, optimize the decision-making process, promote resource integration and coordination, and thereby enhance the competitiveness and social service capabilities of universities.

However, although some universities in China have made progress in education informatization, they still face many challenges in the construction of administrative

management informatization. For example, inadequate infrastructure, low level of informatization management, and low informatization quality of teachers have seriously affected the management efficiency of universities. In Yunnan Province, China, in particular, although some universities have made certain achievements, problems such as lagging administrative management concepts, overlapping functions, and imperfect performance appraisal mechanisms are still prominent.

Therefore, studying the impact of Education Management Informatization on the Administrative Efficiency of universities, especially in the actual situation of S University in Yunnan Province, China, has important theoretical and practical significance. Through in-depth exploration of these issues, it can provide a reference for Yunnan Province and other universities to promote the further development of higher education informatization and management innovation.

Research Objectives

1. To study the impact of infrastructure for Education Management Informatization on the Administrative Efficiency of universities
2. To study the impact of Applied Information Management for Education Management Informatization on the Administrative Efficiency of universities
3. To study the impact of Teachers' Information Literacy for Education Management Informatization on the Administrative Efficiency of universities

Conceptual Framework

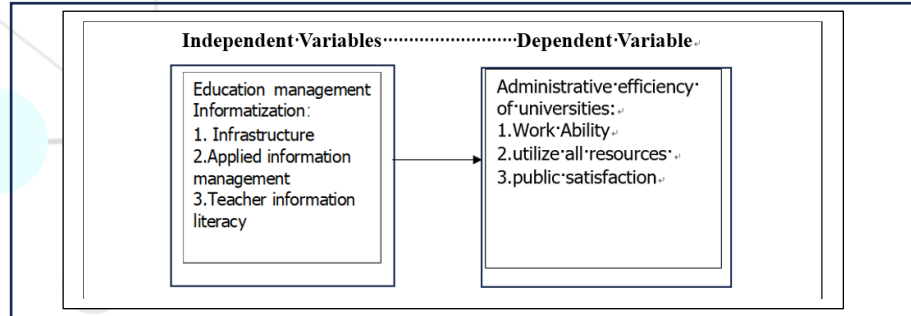


Figure 1: Conceptual Framework Diagram

Hypotheses

H₁: The infrastructure of education management informatization has a positive impact on the administrative efficiency of universities.

H_{1a}: The infrastructure of education management informatization has a positive impact on the work ability of the administrative efficiency of universities.

H_{1b}: The infrastructure of education management informatization has a positive impact on the utilization of all resources of the administrative efficiency of universities.

H_{1c}: The infrastructure of education management informatization has a positive impact on the public satisfaction of the administrative efficiency of universities.

H₂: Applied Information Management of Education Management Informatization has a positive impact on the Administrative Efficiency of universities

H_{2a}: Applied Information Management of Education Management Informatization has a positive impact on the Work Ability of the Administrative Efficiency of universities

H_{2b}: Applied Information Management of Education Management Informatization has a significant positive impact on the Utilization of all resources of the Administrative Efficiency of universities

H_{2c}: Applied Information Management of Education Management Informatization has a positive impact on the Public Satisfaction of the Administrative Efficiency of universities

H₃: Teachers' Information Literacy in Education Management Informatization has a positive impact on the Administrative Efficiency of universities.

H_{3a}: Teachers' Information Literacy in Education Management Informatization has a positive impact on the Work Ability of the Administrative Efficiency of universities.

H_{3b}: Teachers' Information Literacy in Education Management Informatization has a positive impact on the Utilization of all resources of the Administrative Efficiency of universities.

H_{3c}: Teachers' Information Literacy in Education Management Informatization has a positive impact on the Public Satisfaction of the Administrative Efficiency of universities.

Literature Review

1. Related concepts

1) Education Management Informatization

Through modern information technology, all aspects of education management are optimized and innovated to improve the efficiency and quality of education management. The core lies in the use of information technology to achieve automation of management processes, sharing of information resources, and scientific management decision-making. Lu Yinzhi (2024) pointed out that big data plays an important role in school education management. Through data-driven decision-making, educational data mining, and predictive analysis, it can significantly improve the scientific nature and efficiency of school education management.

2) Administrative Efficiency of universities

The administrative efficiency of universities refers to how to reasonably use various resources to provide services to the public and achieve a high level of public satisfaction. It includes quantitative, qualitative, effective, influential, and public satisfaction evaluations (Huang Haiman, 2019). Efficiency construction is a high-level management activity that organically combines various elements of management with efficiency as its fundamental goal (Deng Zhiping, 2021).

2. Related theory

1) Information Management Theory

Information management mainly refers to comprehensive management, such as organizational planning, for information construction and application. It covers the following two aspects: construction and application management. The two are complementary and closely related. The former is the prerequisite for the latter, while the latter is the continuation and further deepening of the former. In essence, information management and management informatization are the same concept, just different names at different stages of development.

2) Administrative Efficiency Supervision Theory

Administrative efficiency supervision refers to the comprehensive supervision of the legality, timeliness, and utilization of administrative resources by administrative supervision organs and other supervisory entities authorized by laws and regulations to ensure the proper exercise of public power and protect the public interest.

3) Collaboration Theory

Haken proposed collaboration theory in 1970 as a comprehensive discipline, and it has now been widely applied in many industries. After analyzing this theory, we learned that its research focuses on the transition of various types of systems from disorder to order, which can also be understood as collaboration theory. There are two reasons for this. First, collaboration theory can be applied to different types of disciplines, and then the general development principles of organizational systems can be summarized. Second, the theme of its research is that many subsystems can form corresponding structures and functions through joint action.

Research Methodology

This study focuses on the impact of Education Management Informatization on the administrative efficiency of S University in Yunnan Province, China. Quantitative methods were used to conduct the research, and a questionnaire was compiled to collect data.

Population and Sample

The research was conducted at S University in Yunnan Province, China, and the research subjects were teachers at S University. As a public comprehensive institution of higher learning directly under the Yunnan Provincial Department of Education, S University has rich and diverse educational resources, a high level of infrastructure, educational resources, and applied information management, and is able to provide rich data support and is highly representative. The university has 680 faculty members. A systematic sampling method was used to select 264 faculty members from S University for a questionnaire survey. Statistical software was employed to analyze the questionnaire results. The sample size was determined using the Taro Yamane formula, with a sample size of 264.

Research Instrument

1. Questionnaire survey method

A questionnaire was designed using a five-point Likert scale and compiled as "The Impact of Education Management Informatization on Administrative Management Efficiency at S University in Yunnan Province, China." A preliminary framework for the questionnaire was developed based on the research objectives and questions. The questionnaire was divided into three parts. The first part collected basic information about the respondents, including age, gender, length of time as a teacher, and frequency of use of the information management system per week. The second part included three dimensions of the independent variable, Education Management Informatization (Infrastructure, Applied Information Management, and Teachers' Information Literacy). The third part included three dimensions of the dependent variable, Administrative Efficiency of universities (Work Ability, Utilize all resources, and Public Satisfaction). After the questionnaire was designed, three experts were invited to conduct an IOC evaluation to ensure that the content of the questionnaire was consistent with the content of this study.

The sample size was calculated using the Taro Yamane formula, resulting in 264 participants (the total number of teachers at S University is 680). The questionnaire was distributed via an online platform, with 264 copies distributed and 264 returned, yielding 264 valid responses, representing a response rate of 100.00%.

2. IOC Scoring

Three professors were invited to conduct a comprehensive evaluation and scoring of the questionnaire. The IOC range for this study was 0.67–1, all exceeding 0.5. The overall content of the questionnaire demonstrated high consistency and good content validity.

3. Literature research method

We searched the full-text database of journal networks and Google Scholar using the keywords “Education Management Informatization” and “Administrative Efficiency” to read references from the past five years (2019-2024) to understand the current research status and results on education management informatization and administrative efficiency, providing theoretical support for this study.

Data Collection

This paper provides descriptive statistics on infrastructure, applied information management, teachers' information literacy, work ability, utilization of all resources, and public satisfaction, as shown in Table 1, which shows the sample size, mean, standard deviation, skewness, and kurtosis of the six variables (infrastructure, applied information management, teachers' information literacy, work ability, utilization of all resources, and public satisfaction).

Table 1 Descriptive analysis of variables

	N	Mean	Standard deviation	Skewness	Kurtosis
Infrastructure	264	3.65	1.01	-0.95	-0.48
Applied Information Management	264	3.55	0.89	-0.78	-0.50
Teachers' Information Literacy	264	3.71	0.98	-0.99	-0.31
Work Ability	264	3.62	0.86	-0.93	-0.23
Utilize all resources	264	3.62	0.90	-1.04	-0.01
Public Satisfaction	264	3.68	0.92	-1.10	0.10

This study used statistical software to measure the reliability of the variables and obtained Cronbach's α coefficients. Cronbach's α coefficient is a commonly used reliability indicator. As shown in Table 2, the Cronbach's α value of the scale was 0.963, indicating that the internal consistency of the entire scale was good and suitable for further statistical analysis.

Table 2 Reliability Analysis

Clonbam Alpha	number of items
0.963	29

This study conducted KMO (Kaiser-Meyer-Olkin) value tests and Bartlett's sphericity tests for validity analysis to determine whether factor analysis could be performed. As shown in Table 3, the KMO value was 0.973. Generally, when the KMO coefficient is >0.6 , the variables are considered to be correlated. If the significance level of Bartlett's sphericity test is <0.05 , it indicates that the questionnaire has good structural validity and that the variables are correlated.

Table 3 KMO and Bartlett's tests

KMO sampling adequacy measure		0.973
Bartlett's sphericity test	approximate chi-square	4420.86
	degree of freedom	406
	significance	0.000

This study used Spearman's correlation analysis to examine the correlation between variables. As shown in Table 4, the correlation coefficients between all variables ranged from 0.595 to 0.687 and were all significant at the 0.01 level, indicating that there was a strong positive correlation between these variables.

Table 4 Correlation analysis of variables (Note: ** represents $p < 0.01$)

	Infrastructure	Applied Information Management	Teachers' Information Literacy	Work Ability	Utilize all resources	Public Satisfaction
Infrastructure	1					
Applied Information Management	0.665**	1				
Teachers' Information Literacy	0.628**	0.644**	1			
Work Ability	0.646**	0.687**	0.634**	1		
Utilize all resources	0.612**	0.661**	0.596**	0.626**	1	
Public Satisfaction	0.595**	0.613**	0.678**	0.614**	0.604**	1

Data Analysis

1. Results of Data Analysis of objective 1

Regression analysis was conducted with infrastructure as the independent variable and work ability as the dependent variable. As shown in Table 5, the VIF of the analysis model was 1, less than 5, the F value was 641.167, and R^2 was 0.709, indicating that infrastructure could explain 70.9% of the variation in work ability, and the model had a good fit. The B value is 0.83, the t value is 25.321, and the significance level is less than 0.001, indicating that infrastructure has a significant positive impact on work ability.

Table 5 Regression analysis of infrastructure on work ability

model	unstandardized coefficient		standardization coefficient	t	significance	collinearity statistics	
	B	Standard error	Beta			tolerance	VIF
(Constant)	0.999	0.11		9.301	<0.001		
Infrastructure	0.719	0.03	0.842	25.321	<0.001	1	1
F	641.167						
R^2	0.709						
Dependent variable: Work Ability							

Regression analysis was conducted with infrastructure as the independent variable and utilization of all resources as the dependent variable. As shown in Table 6, the VIF of the analysis model was 1, less than 5, the F value was 581.026, and R^2 was 0.688, indicating that

infrastructure could explain 68.8% of the variation in the utilization of all resources, and the model had a good fit. The B value is 0.842, the t value is 24.104, and the significance level is less than 0.001, indicating that infrastructure has a significant positive impact on the utilization of all resources.

Table 6 Regression analysis of infrastructure on utilizing all resources

model	unstandardized coefficient		Standardization coefficient	t	significance	collinearity statistics	
	B	standard error	Beta			tolerance	VIF
(Constant)	0.922	0.116		7.94	<0.001		
Infrastructure	0.739	0.031	0.83	24.104	<0.001	1	1
F	581.026						
R ²	0.688						
Dependent variable: Utilize all resources							

Regression analysis was performed with infrastructure as the independent variable and public satisfaction as the dependent variable. As shown in Table 7, the VIF of the analysis model was 1, less than 5, the F value was 566.606, and R² was 0.683, indicating that infrastructure could explain 68.3% of the variation in public satisfaction and that the model had a good fit. The B value is 0.826, the t value is 23.803, and the significance level is less than 0.001, indicating that infrastructure has a significant positive impact on public satisfaction.

Table 7 Regression Analysis of Infrastructure on Public Satisfaction

model	unstandardized coefficient		Standardization coefficient	t	significance	collinearity statistics	
	B	Standard error	Beta			tolerance	VIF
(Constant)	0.933	0.12		7.795	<0.001		
Infrastructure	0.753	0.032	0.826	23.803	<0.001	1	1
F	566.606						
R ²	0.683						
Dependent variable: Public Satisfaction							

2. Result of Data Analysis of objective 2

Regression analysis was conducted with applied information management as the independent variable and work ability as the dependent variable. As shown in Table 8, the VIF of the analysis model was 1, less than 5, the F value was 549.302, and R² was 0.676, indicating that applied information management can explain 67.6% of the variation in work ability, and the model has a good fit. The B value is 0.822, the t value is 23.437, and the significance level is less than 0.001, indicating that applied information management has a significant positive effect on work ability.

Table 8 Regression analysis of work ability after applying information management

model	unstandardized coefficient		Standardization coefficient	t	significance	collinearity statistics	
	B	standard error	Beta			tolerance	VIF
(Constant)Applied Information Mangagement	0.82	0.123		6.653	<0.001		
	0.79	0.034	0.822	23.437	<0.001	1	1
F	549.302						
R ²	0.676						
Dependent variable: Work Ability							

Regression analysis was conducted with applied information management as the independent variable and utilization of all resources as the dependent variable. As shown in Table 9, the VIF of the analysis model was 1, less than 5, the F value was 486.649, and R² was 0.649, indicating that applied information management can explain 64.9% of the variation in utilization of all resources, and the model has a good fit. The B value is 0.806, the t value is 22.06, and the significance level is less than 0.001, indicating that applied information management has a significant positive effect on the full utilization of resources.

Table 9 Regression analysis of applied information management on utilizing all resources

model	unstandardized coefficient		standardization coefficient	t	significance	collinearity statistics	
	B	standard error	Beta			tolerance	VIF
(Constant)	0.753	0.134		5.624	<0.001		
Applied Information Mangagement	0.808	0.037	0.806	22.06	<0.001	1	1
F	486.649						
R ²	0.649						
Dependent variable: Utilize all resources							

Regression analysis was conducted with Applied Information Management as the independent variable and Public Satisfaction as the dependent variable. As shown in Table 10, the VIF of the analysis model is 1, which is less than 5, the F value is 490.775, and the R² is 0.651, indicating that Applied Information Management can explain 65.1% of the variation in Public Satisfaction, and the model has a good fit. The B value is 0.807, the t value is 22.153, and the significance level is less than 0.001, indicating that applied information management has a significant positive effect on public satisfaction.

Table 10 Regression analysis of public satisfaction with applied information management

model	unstandardized coefficient		standardization coefficient	t	significance	collinearity statistics	
	B	standard error	Beta			tolerance	VIF
(Constant)	0.746	0.137		5.461	<0.001		
Applied Information Management	0.827	0.037	0.807	22.153	<0.001	1	1
F	490.775						
R ²	0.651						
Dependent variable: Public Satisfaction							

3. Result of Data Analysis of objective 3

Regression analysis was conducted with Teachers' Information Literacy as the independent variable and Work Ability as the dependent variable. As shown in Table 11, the VIF of the analysis model was 1, less than 5, the F value was 526.259, and R² was 0.667, indicating that Teachers' Information Literacy could explain 66.7% of the variation in Work Ability, and the model had a good fit. The B value is 0.817, the t value is 22.94, and the significance level is less than 0.001, indicating that teachers' information literacy has a significant positive effect on work ability.

Table 11 Regression Analysis of Teachers' Information Literacy on Work Ability

model	unstandardized coefficient		standardization coefficient	t	significance	collinearity statistics	
	B	standard error	Beta			tolerance	VIF
(Constant)	0.95	0.12		7.885	<0.001		
Teachers' Information Literacy	0.72	0.031	0.817	22.94	<0.001	1	1
F	526.259						
R ²	0.667						
Dependent variable: Work Ability							

Regression analysis was conducted with teachers' information literacy as the independent variable and utilization of all resources as the dependent variable. As shown in Table 12, the VIF of the analysis model was 1, less than 5, the F value was 510.046, and R² was 0.66, indicating that teachers' information literacy could explain 66% of the variation in the utilization of all resources, and the model had a good fit. The B value is 0.812, the t value is 22.584, and the significance level is less than 0.001, indicating that teachers' information literacy has a significant positive effect on the utilization of all resources.

Table 12 Regression analysis of teachers' information literacy on utilizing all resources

model	unstandardized coefficient		standardization coefficient	t	significance	collinearity statistics	
	B	standard error	Beta			tolerance	VIF
(Constant)	0.844	0.127		6.645	<0.001		
Teachers' Information Literacy	0.747	0.033	0.812	22.584	<0.001	1	1
F	510.046						
R ²	0.66						
Dependent variable: Utilize all resources							

Regression analysis was conducted with teachers' information literacy as the independent variable and public satisfaction as the dependent variable. As shown in Table 13, the VIF of the analysis model was 1, less than 5, the F value was 670.063, and R² was 0.718, indicating that teachers' information literacy could explain 71.8% of the variation in public satisfaction, and the model had a good fit. The B value is 0.847, the t value is 25.886, and the significance level is less than 0.001, indicating that teachers' information literacy has a significant positive effect on public satisfaction.

Table 13 Regression Analysis of Teachers' Information Literacy on Public Satisfaction

model	unstandardized coefficient		standardization coefficient	t	significance	collinearity statistics	
	B	standard error	Beta			tolerance	VIF
(Constant)	0.72	0.118		6.092	<0.001		
Teachers' Information Literacy	0.797	0.031	0.847	25.886	<0.001	1	1
F	670.063						
R ²	0.718						
Dependent variable: Public Satisfaction							

Research Results and Discussion

1. Research Results

The infrastructure of Education Management Informatization has a positive impact on the Administrative Efficiency of universities, among which the infrastructure of Education Management Informatization has a positive impact on the Work Ability, Utilize all resources and Public Satisfaction of the Administrative Efficiency of universities.

Applied Information Management of Education Management Informatization has a positive impact on the Administrative Efficiency of universities, among which the Applied Information Management of Education Management Informatization has a positive impact on the Work Ability, Utilize all resources and Public Satisfaction of the Administrative Efficiency of universities.

Teachers' Information Literacy of Education Management Informatization has a positive impact on the Administrative Efficiency of universities, among which the Teachers' Information Literacy of Education Management Informatization has a positive impact on the Work Ability, Utilize all resources and Public Satisfaction of the Administrative Efficiency of universities.

2. Discussion of Research Results

The infrastructure, application systems, and teachers' information literacy of education management informatization have a significant positive impact on the administrative efficiency of universities. First, a comprehensive information infrastructure (such as computer hardware, network environment, and management platform) provides efficient and stable technical support for administrative staff and teachers, improving the speed and accuracy of information flow, thereby enhancing work ability and decision-making efficiency. At the same time, automated system processes reduce human error and operating costs, making daily management tasks (such as course scheduling and exam management) more efficient and standardized. The introduction of intelligent decision support systems further helps teachers to grasp key data in real time, improving response speed and processing capabilities.

The effective application of information management promotes the scientific and efficient allocation of resources. Universities can use integrated management platforms to achieve centralized management and dynamic allocation of data such as human resources, financial resources, and teaching resources, avoiding duplication and waste of resources. Various resources (such as classrooms, laboratories, and teaching equipment) are centrally scheduled through information systems to improve efficiency. Cross-departmental data sharing and business collaboration have also become smoother thanks to the interconnection of information systems, providing managers with a data-supported basis for decision-making and promoting the overall operational efficiency of universities.

The improvement of informatization has significantly enhanced public satisfaction. Improved service platforms enable students and parents to easily access grades, course schedules, payment information, and other information, achieving a highly transparent and efficient service experience. Teachers' information literacy has further promoted the improvement of service quality. Their professionalism and collaboration in system use, resource management, and feedback response help strengthen interaction and trust between schools and the public. In addition, online feedback mechanisms and data analysis capabilities enable universities to optimize service content and processes in real time, comprehensively improving public recognition of administrative management.

Research Suggestions

1. Increase investment in information infrastructure, focusing on strengthening network coverage, data centers, and office equipment construction and upgrades. At the same time, introduce intelligent management tools to achieve real-time monitoring, automated operation and maintenance, and fault warning for infrastructure, improving resource allocation efficiency and management transparency. Strengthen network security system construction, establish early warning and emergency response mechanisms, and ensure the stable and secure operation of administrative management work.

2. Integrate scattered business platforms and build a unified comprehensive information management system to promote data sharing and process optimization, thereby improving the scientific nature and response speed of administrative work. Use big data technology to conduct in-depth analysis of various types of management data to provide

accurate decision-making support for the school. At the same time, continuously optimize system functions to meet the actual needs of university management and improve work efficiency and service quality.

3. Establish a systematic information training mechanism, set up personalized courses for different positions, improve the digital literacy of teachers and administrative staff, incorporate information application capabilities into performance evaluations, and establish incentive mechanisms.

4. Future research recommendations Expand the sample scope to enhance the representativeness of the research, deeply explore the interactive relationship between education management informatization and administrative efficiency, and reveal the influencing mechanisms through empirical research and case analysis to promote the continuous optimization and development of higher education management informatization.

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