

How Can Capital Investment Improve the Development Level of University Informatization? A Moderated Chain Mediation Model

Zhen Zhu

E-mail: zz@zbtu.edu.cn

ORCID: <https://orcid.org/0000-0002-6140-1022>

Affiliation: College of Education, Zhejiang Normal University, China

ROR: <https://ror.org/01vevwk45>

Mohammed A.M. AlGerafi

E-mail: malgerafi@gmail.com

ORCID: <https://orcid.org/0000-0003-0243-5318>

Affiliation: School of foreign languages, Zhejiang Gongshang University, China

ROR: <https://ror.org/01k1q2t30>

ShuFen Wan

E-mail: wsf@zbtu.edu.cn

ORCID:

Affiliation: College of International Education, Zhejiang Business Technology Institute, China

ROR: <https://ror.org/03yh3e798>

CiXian Lu

E-mail: malgerafi@gmail.com

ORCID: <https://orcid.org/0000-0002-8769-3051>

Affiliation: Institute of Educational Development, Qingdao University, China

ROR: <https://ror.org/021cj6z65>

Annotation. Under the background of the digital transformation of education, increasing capital investment to promote the construction of university informatization is an important measure to boost the high-quality development of higher education. However, there is no systematic explanation and demonstration of the internal mechanism, logic, and conditions through which funds affect the development of university informatization. Because of this, this paper attempts to build a moderated chain mediation model based on literature review. Using official data from 95 universities in Zhejiang province to evaluate the informatization development level, descriptive statistics, correlation analysis, regression analysis, and mediation and moderation effects were conducted using SPSS 26 and Process V3.5 plugins to explore the impact of capital investment on the informatization development level of universities. The results show that capital investment in college informatization construction can significantly and positively affect the level of informatization development. Information leadership and human resource investment in colleges and universities play an intermediary role in the relationship between capital investment and information development level. The mechanism of university informatization construction positively regulates the relationship between human resource investment and informatization development level. Additionally, the mechanism of university informatization construction positively regulates the indirect effect of capital investment on the level of informatization development. The research results reveal the internal mechanism and function path of "how the capital investment affects the development level of university informatization" and provide beneficial enlightenment for universities to make full use of informatization funds to conduct construction practices.

Keywords: higher education, digital transformation, capitalization method, action mechanism, sustainable informationization.

JEL classification: D01, G32, I2, O33, Q01.

Introduction

In China, the process of informatization in universities began in the early 1990s, enabling higher educational institutions to effectively monitor administrative activities, promote research and development, enhance the information environment, and improve teaching quality and efficiency (Lipeng *et al.*, 2004). With the significant influence of IT on conventional operational modes of universities, the IT infrastructures are becoming more mature and inclusive (Aiqun, 2018). Nevertheless, the informatization and its applications in higher education institutes experience various challenges such as frequent changes in the requirements, insufficient research on informatization, administrative inconsistencies, a gap between scientific research and teaching, unsatisfactory results of system application, and so forth (Fedorenko *et al.*, 2019). The development of university informatization is a complex and persistent project (Xiaowen, 2021). There is a need to abide by the principles of proceedings from reality, assuming the overall condition, and planning as a whole, and step by step, implementing the informatization process. Further, universities should fully depend on the prospects brought about by the IT development, augment capital investment, and thoroughly upgrade the quality, scientific research, teaching quality, and informatization management of the university (Wu, Liu, 2021).

Presently, the complexity and scope of higher education institutions call for efficient and rapid planning methods. Notably, the universities' heads are not able to personally supervise different activities that are taking place in their institutions (Mwesiga, Okendo, 2018). Although these departmental heads are expected to have an overview of diverse components, including students, facilities, staff members, financial resources, and the environment. Further, department heads should also be able to effectively integrate all the elements into an operational system. Meanwhile, individual creativity must be elevated at all levels of the administrative hierarchy without undermining the organizational aims. Thus, higher education institutions are increasingly pressurized to increase their accountability, rationalize the decision-making processes, optimally allocate their resources, and establish transparency in their operations and objectives' evaluation (Austin, Jones, 2018). All such factors call for internal supervision and modification of the management process through operational control of the system's components, that is, appraisal of the university's realizations, choices of programs and priorities, and revision of procedures. Such an aspect of internal modification and supervision (feedback) makes informatization a highly crucial aid to university operations (Wiyono *et al.*, 2021). Specifically, computers assist the investigation of the interdependence of the diverse elements of the university system, rationalizing the resource management and decision making by effective communication, control, and feedback mechanisms. Supported by the accelerating development of increasingly optimized software solutions, new architectures and technological developments facilitate the application, especially in hardware development due to miniaturization, thereby offering a substantial amount of diverse but valuable information for university management (Zaman *et al.*, 2021).

The information system provides integration of files based on one-time entry of data into a centralized common setup of files to ensure availability of information across the university (Stefan *et al.*, 2024). The informatization furnishes significant volumes of detailed and organized information on which the university administrators can base their plans and make appropriate decisions. Moreover, the informatization automates the cross-referencing among files and information flow among subsystems. Likewise, it also extends the historical information required to support and develop the essential models while exhibiting the tendencies and trends of the university, including performance indicators of different subsectors in the university. As a result, the informatization automates and modernizes the traditional reporting needs of the university (Elhoseny *et al.*, 2017). Owing to the above factors, a large number of

universities in both developed and emerging economies, such as China, attempt to establish information systems for performing diverse managerial tasks (Mohrman, 2008). Nonetheless, the progress toward such digital integration varies across different regions, cities, provinces, and countries. At the national level, different problems exist in China related to the informatization of higher education institutions, such as a lack of timeliness, uneven MIS development among universities, as well as the pertinence and accuracy of data utilized in the informatization process.

In recent years, universities and colleges have significantly increased their investment in informatization construction. According to the statistics from the Report on Informatization Development in Chinese Universities (2021), the annual average investment in informatization construction in domestic universities amounted to 10.56 million RMB, which is predicted to continuously rise in the future (Report on the Development of Informatization in Chinese Universities, 2021). However, based on the observed practical outcomes, there is still a need to enhance the current impact of capital investment in elevating the informatization development level of universities and colleges. Relevant research has indicated that certain tendencies persist, such as a focus on “hardware development over software”, an emphasis on “investment rather than guarantee”, and a prioritization of “construction over development” when universities and colleges invest in informatization. Moreover, the enduring challenge of high investment and low output continues to impede progress in improving the informatization development level across Chinese universities and colleges (Lei *et al.*, 2017). So, what is the internal mechanism and path through which capital investment affects the improvement of the informationization level of universities? It has become an important theoretical and practical issue in the digital transformation of higher education. In view of this, the study first constructed a moderated chain mediated effect model through literature review. Secondly, based on the evaluation data of the informationization development level of universities in Zhejiang Province, 95 universities were selected as research objects, and SPSS 26 and Process V3.5 plugins (Copyright by Andrew F. Hayes) were used to explore and reveal the inherent and logical relationships between “capital investment and improvement in the informatization development level of universities and colleges”. Finally, based on the research findings, policy recommendations are provided for the construction practices of universities in three aspects: information leadership, human resource investment, and information construction mechanisms. The research provides theoretical and practical references for achieving the ideal vision of “low investment, high output” in the digital transformation of higher education.

1. Literature Review and Research Hypotheses

1.1 The Informatization Development Level of Universities and Colleges

The level of informatization development is a description of the scale, speed, and standard of informatization development from the perspectives of time and space, quantity, and quality, as well as technology and concept. It covers the informatization development of people, materials, and policies, revealing not only the application of information technology but also the transformation and development of thought, concepts, and models in the informatization environment (Zhihe *et al.*, 2019). Existing studies use methods such as the Key Factor Analysis, the Principal Component Analysis, the Delphi Method, and the Analytic Hierarchy Process to establish the index system of the informatization development level to clarify the framework, contents, hierarchies, and weights. At the same time, since 2016, many provinces and cities have taken the national and regional informatization-related documents as a basis for formulating and have conducted operational practices through self-assessment by

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universities and colleges and expert assessments (Shanrong, 2016). *Table 1* lists the main indicator systems for the development level of informatization in universities currently studied and practiced.

Table 1. Main Indicator Systems for the Development Level of Informatization in Universities

	Year	Researcher	Method	Main Observation Dimensions (Primary Indicators)
Related research	2011	Zhou Pinghong et al.	Key factors and structural equations	Guarantee mechanism, Infrastructure, Teaching applications, Management applications, and Resource construction
	2016	Pu Shanrong	Principal Component Projection and Entropy Weight Method	Management system and mechanism, Infrastructure construction, Resource construction, Application construction, Standard specifications, and Information technology effectiveness
	2019	Li Zhihe et al.	Delphi method and Analytic Hierarchy Process	Operating mechanism, Infrastructure, Teaching and research, Management services, Information literacy, and Network security
	2020	Li Lu and Wang Yunwu	Delphi method and Expert ranking	Organizational management, Information environment, Information resources, Integrated applications, Talent cultivation, and Distinctive development
	2020	Zhang Yongbo and Hu Xiaojie	Text analysis and Comparative study	Governance system, Smart environment, Smart applications, Network security, Characteristics, and Innovation
	2021	Huang Yan et al.	Delphi method and Analytic Hierarchy Process	Guarantee mechanism, Infrastructure, Data resources, and Application service system
	Year	Area	Operation	Main Observation Dimensions (Primary Indicators)
Provincial practice	2016	Chongqing City	Self-evaluation + Expert online review + On-site spot check	Guarantee mechanism, Infrastructure, Business support, Data and Resources, and Smart applications
	2017	Anhui Province	Self-evaluation + Expert online review	Guarantee mechanism, Infrastructure, Business support, Data and Resources, Business applications, Characteristics, and Innovation
	2018	Henan Province	Self-evaluation + On-site evaluation	Guarantee mechanism, Infrastructure, Basic support platform, Digital resources, Smart applications, Network information security
	2018	Jiangsu Province	Self-evaluation + Provincial review spot check	Guarantee mechanism, Smart environment, Integrated innovation, Digital resources, Network security, and Distinctive development
	2018	Jiangxi Province	Self-evaluation + Provincial review spot check	Infrastructure, Information Applications, Data and Resources, Network Security, Features and Awards
	2020	Zhejiang Province	Self-evaluation + Expert online review	Governance system, Smart environment, Smart applications, Network security, Characteristics, and innovation

Source: created by the authors.

In terms of the main observation dimensions, although various index systems differ slightly in expression and structure, they cover the five aspects, including the guaranteed mechanism, the infrastructural environment, informatization application, network information security, characteristics, and innovation,

which are to some extent homogeneous. Among them, the guaranteed mechanism includes indexes relating to the investment in the mechanisms, institutions, standards, people, properties, and materials of informatization construction, reflecting the degree of attention to informatization paid by universities and colleges and the maturity degree of institutional construction. Infrastructure includes campus networks, cloud computing, the Internet of Things, and an information-based learning environment, reflecting the software and hardware infrastructure construction conditions in universities and colleges. Informatization application primarily assesses the integration of information-based measures and the work of universities in teaching, scientific research, management, and services, as well as the construction conditions of data and resources, which is the “most important and difficult” part of all the index systems. Network security includes specific aspects in terms of the security of the environment, technology, data, and information of informatization of universities and colleges. Characteristics and innovation integrate typical cases of school informatization, appraisals, awards, publicity reports, and project papers, serving as an epitome and reflection of construction effectiveness.

1.2 Capital Investment and Development Level of Informatization

Capital investment in informatization represents the total expenditure by schools on the construction, operation, maintenance, and security guarantee of educational and teaching informatization. It involves the infrastructural construction of informatization, application software development, purchase of teaching resources, software and hardware operation and maintenance upgrading, service outsourcing and human resources development (Hong *et al.*, 2004). Current research indicates that capital investment is the primary driver for informatization construction and acts as a bottleneck, restricting the level of informatization development (Jiong, Liqin, 2019). Using a sample of over three hundred universities and colleges in ten provinces in eastern, central, and western China, Zhou Pinghong explored the influencing factors and characteristics of educational digitalization development in universities and colleges. The research findings demonstrate that the guaranteed mechanism is the most significant factor influencing the informatization development level of higher education. Among the various observational indexes of the guaranteed mechanism, the standardization factor of capital investment in informatization features the highest factor loading (Pinghong *et al.*, 2011). Xie Zhongxin utilized interpretive structural modeling to conduct an analytic hierarchy analysis of the main factors influencing informatization development, with capital investment identified as one of the nine major factors influencing the informatization development level (Zhongxin, 2009). Jiang Jie *et al.* adopted system dynamics to set up the causal graph and flow graph models of the higher education informatization system. Through simulated analysis of different parameter and variable combinations, they found that increased capital investment in informatization had positive effects on the fixed assets of informatization, human resources development, informatization application and resource construction (Jie *et al.*, 2016). The researchers collaborated on the development of key technologies and services, the integration of management business systems, the digital twin campus platforms, and ecological development strategies for digital transformation in the universities and colleges (Gong *et al.*, 2023; A. Wang, 2023; S. Wang *et al.*, 2023; Zhu *et al.*, 2022). They discussed specific frameworks, measures, and pathways for increasing capital investment to enhance the level of informatization development. Additionally, they verified the considerable influence of capital investment in informatization construction from the practical perspective of informatization in universities and colleges.

Hypothesis 1 (H1) was accordingly proposed: Capital investment in informatization of universities and colleges can significantly influence the informatization development level.

1.3 The Mediating Effects of the Informatization Leadership

Informatization construction is a systematic transformation of the entire system. A slight move in one aspect may affect the situation. This process necessitates the formulation of comprehensive plans and vigorous promotion by the “top leaders”. The role of the “top leaders” in the informatization projects of universities and colleges has gained consensus among researchers and practitioners. Informatization leadership has also become the only dynamic factor among the numerous influencing factors of informatization in universities and colleges. Awuzie *et al.* gathered cases of digital transformation in universities and colleges, employed the qualitative content analysis method, and established the SWOT influence factor analysis framework for digital transformation. According to the findings, capital investment is a crucial domain influencing informatization leadership, and a continual rise in capital investment frequently correlates with a positive improvement in informatization leadership (Awuzie *et al.*, 2021). To incrementally enhance capital investment in informatization each year, the University of Michigan established school-wide leadership groups to recommend and guide suitable service investments. They implemented a unified and streamlined capital decision-making framework to enhance the transparency of capital utilization and promote the substitution of outdated services with new ones (U-M IT Strategic Plan, 2018). Substantial capital investment encourages universities and colleges to constantly improve the leading institutions of informatization, clarify the functions of related departments, make overall plans, and coordinate the sustainable development of informatization. However, some research has highlighted that the current level of informatization leadership in certain universities and colleges is still low (Shen *et al.*, 2023). These institutions lack a foundation for effective coordination, supervision, and promotion. Many projects suffer from inadequate preliminary assessments or unclear requirements. Construction initiatives are often rushed, lacking subsequent promotion measures, and neglecting the adoption of supporting institutional standards and systems. Common issues include idle software and hardware equipment, a low business system utilization rate and superficial and formalistic application practices (Viznyuk *et al.*, 2022). Consequently, the overall promotion of informatization was hindered and the ability and level of informatization development was low. Some studies have demonstrated that informatization leadership has a positive impact on the level of enterprise informatization development level (Rhatsarun *et al.*, 2024). It is evident that informatization leadership is a crucial factor influencing the informatization development level. Therefore, universities and colleges should enhance their informatization leadership, improve organizational structures, establish leading institutions headed by top leaders in coordination with various departments, address key challenges in informatization, increase the efficiency of capital investment in informatization, and elevate their overall informatization development capabilities and levels.

Hypothesis 2 (H2) was accordingly proposed: The informatization leadership of universities and colleges plays a mediating role in the relationship between capital investment and informatization development level.

1.4 The Mediating Effect of Investment in Human Resources for Informatization

The investment in human resources for informatization by universities and colleges primarily refers to the number of professional technical staff engaged in informatization work and those in management. Some research has also indicated that capital investment and team construction are the basic factors influencing the informatization development (Sutrisno *et al.*, 2023). With the constant increase in favorable government finance and the growing emphasis on informatization by universities and colleges, there has been a significant improvement in capital investment, leading to higher demands for team

construction. Professionals with high competency in information technology and interdisciplinary talents proficient in both business and technology are required (Yang, Fan, 2022). Technical management talents are also needed to oversee the overall informatization strategy development of universities and colleges featuring complicated business systems and operation mechanisms (Qintai, 2016). However, at present, universities and colleges have primarily invested in the infrastructure, software, and hardware equipment of informatization and neglected the investment in personnel recruitment, skill development, caliber improvement and professional training (Valks *et al.*, 2021). This has resulted in a significant lag in the development of human resources in informatization. Capital investment must be finally implemented and realized through investment in human resources (Erlyn *et al.*, 2022). Merely investing in construction, outsourcing human resources, and prolonged dependence on third parties can adversely impact the sustainable development of informatization (Yiqin, 2020). This approach hinders the effective implementation of the informatization strategies of universities and colleges, making it challenging to stabilize, accumulate, and form the core capabilities of informatization. The enduring challenge of a “talent shortage” in universities and colleges for informatization has emerged as a critical factor limiting the benefits derived from the capital investment made during the “Fourteenth Five-Year Plan”. It is poised to become the “bottleneck” impeding the future construction and development of universities and colleges in informatization.

Hypothesis 3 (H3) was accordingly proposed: The investment in human resources for informatization by universities and colleges plays a mediating role in the relationship between capital investment and informatization development level.

1.5 The Chained Mediating Effects of the Informatization Leadership and Human Resources Investment

Current research has highlighted the clear correlation between informatization leadership and human resource development. Wilson *et al.* discovered and revealed the inherent mechanism of the positive impact of leadership on informatization development by investing in human resources while exploring the intelligent educational development of universities and colleges (Wilson *et al.*, 2021). In a questionnaire survey of 349 faculty of universities and colleges, Wang *et al.*, through an empirical study, found that leadership and competency in human resources can have a positive influence on the level of intelligent education. Leadership can support human resource investment in terms of consciousness, preparation, and motivation. The communication relationship between leadership and human resources can help improve the intelligent education level and make the development mode of human resources more mature (AlGerafi, Zhang, 2021; X. Wang *et al.*, 2021). According to the above research and theories relating to informatization leadership, the study infers that informatization leadership should promote human resource investment. On one hand, the decisions of the leaders of universities and colleges on the strategy orientation, objective setting, organization design and personnel scale of informatization in universities and colleges are the prerequisites for investment in human resources (Rocha *et al.*, 2022). On the other hand, attitude, and choice of investment in human resources can be formulated based on the strategic targets and responsibility division in line with the conditions of the universities and colleges. The precision with which leaders of universities and colleges comprehend the strategic orientation and human resources demands in informatization contributes to maintaining alignment with job objectives and enhancing the effectiveness of capital investment on this basis (Xingyong *et al.*, 2020).

Hypothesis 4 (H4) was accordingly proposed: The informatization leadership of universities and colleges and human resources investment play a chained mediating effect on influencing the informatization development level.

1.6 The Regulating Effects of the Informatization Construction Mechanism

The informatization construction mechanism in universities and colleges is evident in two main categories: System standard specifications and motivating rewards and punishment measures (Youzeng *et al.*, 2018). The system standard specifications form the foundation of informatization construction in universities and colleges, including a series of management systems, technical standards and interface specifications involved in intelligent campus development. The motivating rewards and punishment measures constitute detailed implementation rules designed to assess the roles of organizations and individuals in informatization construction and specify the motivating rewards and punishment measures. Informatization is an activity and behavior characterized by institutionalization, standardization and normalization and individuals are the subjects of such activities and behaviors (Al-Gerafi *et al.*, 2024; Porfírio *et al.*, 2021). The complete informatization construction mechanism helps the workers gain a clearer understanding of their own working standards, models, and procedures. Particularly, when strong organizational support for individual development at the mechanistic level is perceived, it motivates them to exhibit greater work autonomy and initiative, adopt a positive work attitude, and strive to acquire more knowledge, information, and skills related to core tasks. This, in turn, facilitates a significant improvement in the informatization development level (Group *et al.*, 2010).

Hypothesis 5a was accordingly proposed: The informatization construction mechanism of universities and colleges regulates the relations between human resources investment and informatization development level. In other words, the more complete the informatization construction mechanism, the stronger the positive influence of human resources investment in the informatization development level, and vice versa.

The complete informatization construction mechanism focuses on maximizing the role of “humans” and facilitates preferential capital investment in team construction and human resources. This emphasis is not solely confined to informatization infrastructure but extends to related software and hardware equipment. By providing complete basic and comprehensive work instructions, it prevents them from feeling “bewildered”, thereby optimizing the practical impact of human resources investment (Muchar *et al.*, 2022). Meanwhile, the evaluation mechanism and the detailed implementation rules of rewards and punishment serve as crucial “drivers” and “effective means” of informatization construction. Through the institutionalization of these elements, specifying the scale, proportion, and requirements of informatization teams becomes possible. This approach fully harnesses the enthusiasm of secondary units or departments in informatization construction, ensuring a balance between the status of personnel and teams and their respective functions, elevating the level of informatization development.

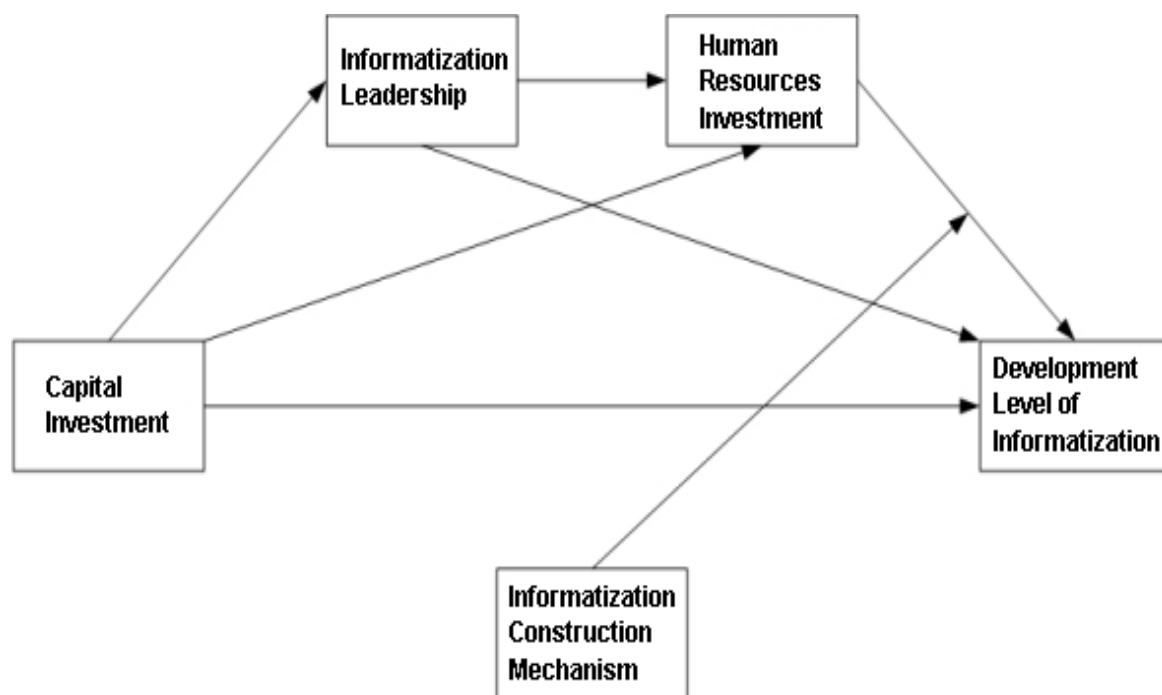
Hypothesis 5b was accordingly proposed: The informatization construction mechanism of universities and colleges positively regulates the indirect effects of capital investment on the informatization development level. In other words, the more complete the informatization construction mechanism, the stronger the indirect effects of capital investment on the informatization development level by investing in human resources.

When the construction mechanism is at a higher level, the leadership's coordinating, supervisory, and promotional functions can be fully realized. Additionally, these functions can continually unlock the

potential of organizations and individuals to invest in human resources, creating a favorable ecosystem characterized by effective capital investment, robust organizational leadership, and ample manpower support (Dong *et al.*, 2021). This transformation ensures that capital investment genuinely enhances the level of informatization development.

Hypothesis 5c was accordingly proposed: The informatization construction mechanism of universities and colleges positively regulates the indirect effects of capital investment on the informatization development level. In other words, the more complete the informatization construction mechanism, the stronger the indirect effects of capital investment on the informatization development level by leadership and human resources investment.

In summary, the study constructed a research model as shown in *Figure 1*.



Source: created by the authors.

Figure 1. Research Models

Overall, existing research lacks a systematic and comprehensive exploration of the relationship between university funding and the improvement of informatization development level. Firstly, the operationalization of concepts is quite difficult, and the level of information technology development is a very abstract concept that is difficult to observe and measure directly. A series of hierarchical related indicators need to be used to reflect and explain it; Secondly, taking the complex and massive organizational structure of universities as the object, research initiated by individual researchers inevitably lacks credibility, and lacks sufficient persuasiveness in terms of effectiveness and applicability; Finally, current research on the level of information technology development in universities mainly focuses on case studies, using qualitative reasoning methods. Although most mention the important guarantee factor of capital investment, it is often overlooked. Moreover, due to the differences in the situation of different universities, it is difficult to achieve a common and regular understanding of how capital investment affects the level of information technology development. The scientific and

representative nature of the conclusions is questionable. To make up for the shortcomings of previous research, this study will use the above research model and official evaluation data from 95 universities in Zhejiang province as samples. Through empirical data analysis, the study will explore the impact mechanism and implementation path of capital investment on the improvement of information technology level. This has significant practical significance in clarifying the mechanism of university information technology construction funds, improving the utilization efficiency of information technology construction funds, and guiding information technology construction practice.

2. Research Methodology

2.1 Data Source

The study utilized 2021 data on the level of informatization development in universities and colleges in Zhejiang Province of China. The evaluation activity was initiated by the official education department of the province and lasted for one month, targeting all ninety-five universities and colleges in the province, including national “Double First Class” universities, provincial key universities, vocational and technical universities, national “Double High” vocational colleges, provincial “Double High” vocational colleges and other types and levels of universities, which can represent the current situation of Chinese universities. The evaluation activity gathered objective data on the informationization construction and development of various universities through official systems. The data and evidence of the universities and colleges were reviewed, confirmed, and submitted by the main leaders of the schools. The educational departments selectively examined the data to ensure its truthfulness and validity. The evaluation process incorporated scoring by the universities and colleges and by the experts, providing a comprehensive reflection of capital investment, leadership, human resources, construction mechanisms, and the overall development level of the universities and colleges in informatization construction in Zhejiang Province. The annual development data from the evaluation serves as a crucial reference for educational departments when verifying the index of supervision and evaluation of informatization construction in universities and colleges.

2.2 Variable Selection

The initial draft of the Evaluation Index System was formed by the education official department of Zhejiang Province in combination with existing research and other provincial practices. Each index item and allocation weight were based on soliciting opinions from the leaders, staff, and teachers and students of the evaluated university information center. The Delphi method was used through multiple rounds of anonymous inquiries and feedback from Zhejiang Province's information technology experts and official managers, and finally formed the "Informatization Construction Evaluation Index System of Universities and Colleges in Zhejiang Province", which includes 5 primary indexes, 18 secondary indexes and 61 tertiary indexes. Based on the relevant research perspectives outlined in the literature review, this study selected the capital investment in the index system as the independent variable, the leadership and human resources investment as the mediating variables, the index relating to the construction mechanism as the moderating variable and the overall informatization development level as the dependent variable. *Table 2* provides specific descriptions and weightings for the selected indexes and observation points.

Table 2. Variable Selection

Type	Variable	Indicator Description	Score
Argument	Capital Investment	The total annual investment in information technology construction in university in the past three years shall not be less than 2%, 1.5-2%, 1.5% or less of the university's budget expenditure	10
Intermediate variables	Informatization Leadership	Establish a network security and information technology construction leadership group led by the main leaders of the university, with the office of the leadership group located in the information technology functional management organization and clear division of labor for information technology construction functions; The university leader serves as the Chief Information Officer (CIO), coordinating the strategic planning and development of Informatization in the university, and coordinating overall resources.	20
	Human Resources Investment	Ratio of full-time technical department personnel (ratio of full-time personnel to number of teachers and students)	15
Moderator variable	Informatization Construction Mechanism	Develop data standards and technical specifications for various types of information application construction, and establish comprehensive rules, regulations, and management methods for information project construction, service operation, network information security, etc.; Based on the particularity of salary in the information technology industry, innovate the employment mechanism, establish and improve the salary management system for the information technology full-time team, and improve the promotion channels for the professional titles of the information technology full-time team; The informatization work of functional departments and teaching units is included in the annual assessment of the school.	25
Dependent variable	Development Level of Informatization	Comprehensive level of governance system, infrastructure, application level, network security, and innovation capability	1000

Source: created by the authors.

2.3 Data Processing

The concept of index completion rates was researched and introduced to mitigate the impact of index weight in the index system on data analysis and solve the inclusion relation of the scoring of indexes at different hierarchies. This allows for the independent observation of interrelations and influences among the indexes. The calculation method is outlined below: Suppose an evaluation system totally has N indexes, a_i represents the actual score of the i^{th} index, $i \in 1 \dots N$, a^*_i represents the full value of the i^{th} index, and then the index completion rate is calculated as $C_i = a_i / a^*_i$. With A as an example, the final scores for its capital investment (the index weight was 10 points) and the informatization development level (the index weight was 1000 points) were 5 points and 795 points, respectively. Consequently, their index completion rates were 0.5 and 0.795, respectively. All follow-up analyses were conducted based on the index completion rate data.

3. Study Results

Compared with traditional case studies using qualitative reasoning methods and individual initiated survey studies, this study uses official evaluation indicators and data, involving a large number and diverse types of schools. The study conducted data analysis using SPSS 26 and Process V3.5 plugins to examine the relationship between funding investment and the level of informationization development in universities. Based on this, the study further explored the mediating and moderating effects of independent variables such as informationization leadership, human resource investment, and construction mechanisms, which improved the scientific and representative nature of the research conclusions and helped to achieve a common and regular understanding of the research questions.

3.1 Descriptive Statistics and Related Analysis

The study used SPSS 26 to analyze the mean, standard deviation, and correlation coefficients of all variables, as shown in *Table 3*.

Table 3. The mean, Standard Deviation, and Correlation Coefficient of Variables

Variable	Mean	Standard Deviation	1	2	3	4
Capital Investment	0.88	0.19				
Informatization Leadership	0.86	0.21	0.279**			
Human Resources Investment	0.72	0.27	0.359**	0.453**		
Informatization Construction Mechanism	0.75	0.22	0.178	0.331**	0.474**	
Development Level of Informatization	0.78	0.13	0.427**	0.528**	0.647**	0.675**

Notes: N=95, ** indicates $p < 0.01$.

Source: own calculations.

The statistics reveal that there is a clear positive correlation among the variables. Particularly, capital investment and informatization development level exhibit a noticeable positive correlation, with a correlation coefficient r of 0.427($p < 0.01$). Leadership and human resources investment similarly show evident positive correlations with the informatization development level, with correlation coefficients of 0.528($p < 0.01$) and 0.647($p < 0.01$), respectively. Furthermore, there is also a positive correlation between leadership and human resources investment, with a correlation coefficient r of 0.453($p < 0.01$). The correlation of the variables provides favorable prerequisites for follow-up analyses.

3.2 Test of the Direct Effects and the Mediating Effects

The study employed the SPSS Process V3.5 plug-in (with 5,000 repetitions of Bootstrap resampling) to test multiple chained mediating effects of the leadership and human resources investment on the relationship between capital investment and informatization development level. A 95% unbiased correction positive confidence interval was established. Initially, Model 4 of the SPSS Process V3.5 plug-in was chosen to individually test the single mediating effects of leadership and human resource investment on the relationship between capital investment and informatization development level. Subsequently, Model 6 was selected to test the chained mediating effects between the two, with specific results presented in *Table 4* and *Table 5*. Data in *Table 4* indicates that the direct effect of capital investment on the informatization development level is 0.296, with a 95% confidence interval of [0.167, 0.424], excluding zero. The main effects are evident, supporting H1. The value of the direct effect of capital investment on leadership is 0.296, with a 95% confidence interval of [0.086, 0.506], excluding 0.

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The direct effect is evident; the direct effect of leadership on the informatization development level is 0.344, with a 95% confidence interval of [0.230, 0.458], excluding 0, and the positive effect is clear. In *Table 5*, the value of the mediating effect of leadership is 0.086, with a 95% confidence interval of [0.019, 0.182], excluding 0 and the mediating effect is apparent. After incorporating the mediation of leadership, the value of the direct effect of capital investment on the informatization development level drops from 0.296 to 0.210 and the confidence interval excludes 0. This indicates that leadership has some mediating effects on the relationship between capital investment and informatization development level. H2 is true.

Table 4. Bootstrap Analysis of Direct Effects between Variables

Path	Effect	SE	95% Confidence Interval
Capital Investment → Development Level of Informatization	0.296	0.065	[0.167,0.424]
Capital Investment → Informatization Leadership	0.296	0.106	[0.086,0.506]
Capital Investment → Human Resources Investment	0.506	0.136	[0.235,0.776]
Informatization Leadership → Development Level of Informatization	0.344	0.057	[0.230,0.458]
Human Resources Investment → Development Level of Informatization	0.318	0.039	[0.241,0.396]
Informatization Leadership → Human Resources Investment	0.601	0.122	[0.358,0.844]

Source: own calculations.

Table 5. Testing the Mediating Effect of Leadership and Human Resource Investment

Path	Direct Effects			Indirect Effect		
	Effect	SE	95% Confidence Interval	Effect	SE	95% Confidence Interval
Capital Investment → Informatization Leadership → Development Level of Informatization	0.210	0.060	[0.091,0.329]	0.086	0.042	[0.019,0.182]
Capital Investment → Human Resources Investment → Development Level of Informatization	0.155	0.057	[0.042,0.267]	0.141	0.046	[0.054,0.237]
Capital Investment → Informatization Leadership → Human Resources Investment → Development Level of Informatization	0.130	0.055	[0.022,0.238]	0.034	0.021	[0.006,0.087]

Source: own calculations.

Similarly, it is possible to test the mediating effects of human resources investment on the relationship between capital investment and informatization development level. In *Table 4*, capital investment shows a clear direct influence on human resources investment and the positive impact of human resources investment on the informatization development level is also evident. *Table 5* indicates that the mediating effects of human resources investment are evident. Upon adding the mediation of human resource investment, the direct effect of capital investment on the informatization development level reduces to 0.155 and the confidence interval excludes 0. This indicates that human resources investment has some mediating effects on the relationship between capital investment and informatization development level. H3 is verified.

Table 5 indicates that the value of the chained mediating effect of leadership and human resources investment on the influence of capital investment on the informatization development level is 0.034, and the confidence interval excludes 0. This indicates that leadership and human resources investment have chained mediating effects on the influence of capital investment on the informatization development level. Meanwhile, the direct effect of capital investment drops to 0.130 and the confidence interval excludes 0, indicating that leadership and human resources investment have some chained mediating effects on the influence of capital investment on the informatization development level. H4 is supported.

3.3 Test of the Moderated Mediating Effects

The study will continuously adopt the Bootstrap Method to test the moderated chained mediating effects. First, the linear regression method in SPSS 26 will be used to test whether the construction mechanism moderates the influence of human resources investment on the informatization development level. Before conducting the test, standardized processing will be applied, and interactive items of human resources investment and the construction mechanism will be constructed. The informatization development level is considered the dependent variable, and leadership, human resources investment, construction mechanism, and interactive items will be added to the model sequentially.

Table 6. Moderating Effect Test

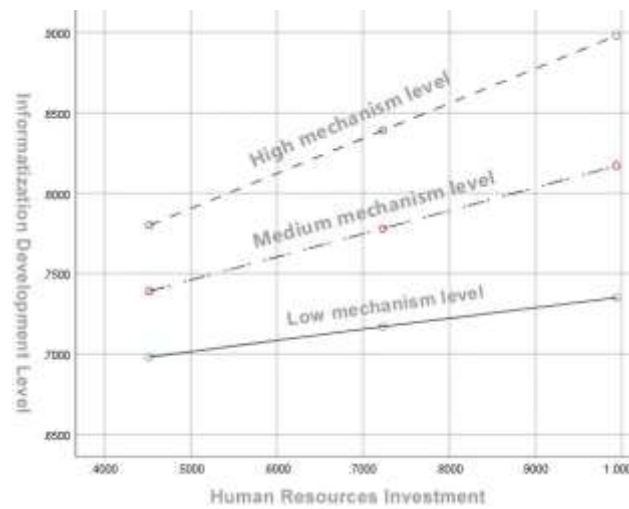
Argument	Dependent Variable								
	Informatization Leadership			Human Investment			Resources Development Level of Informatization		
	Coeff	SE	P	Coeff	SE	P	Coeff	SE	P
Constant	0.602	0.095	0.000	-0.028	0.136	0.838	0.396	0.076	0.000
Capital Investment	0.296	0.106	0.006	0.355	0.131	0.008	0.151	0.045	0.001
Informatization Leadership				0.508	0.123	0.000	0.140	0.045	0.002
Human Resources Investment							-0.112	0.113	0.324
Construction Mechanism							0.032	0.109	0.773
Human Resources Investment * Construction Mechanism							0.338	0.146	0.022
	R²=0.078			R²=0.264			R²=0.686		
	F (1, 93) =7.838, P<0.01			F (2, 92) =16.536, P<0.001			F (5, 89) =38.898, P<0.001		

Source: own calculations.

The results are shown in Table 6. The interactive items have significant positive effects on the informatization development level (Coeff=0.338, SE=0.146, $p<0.05$). This suggests that the construction mechanism significantly moderates the influence of human resources investment on the informatization development level. H5a is true. Figure 2 is the graph of the moderating effect on the construction mechanism. When the degree of improvement in the construction mechanism increases, the positive impact of human resource investment on the level of informatization development becomes more pronounced. In other words, the construction mechanism positively moderates the relationship between human resources investment and informatization development level. The Johnson Neyman graph illustrating the moderating effects of the construction mechanism was generated by the SPSS Process V3.5 plugin and Excel, as shown in Figure 3. It is noteworthy that, using the vertical reference line in Figure 3 as a threshold (construction mechanism=0.581), when the score of the improvement degree of the construction mechanism exceeds 0.581, the moderating effect on the right side of the reference line becomes evident. This suggests that the moderating effect of the construction mechanism is not

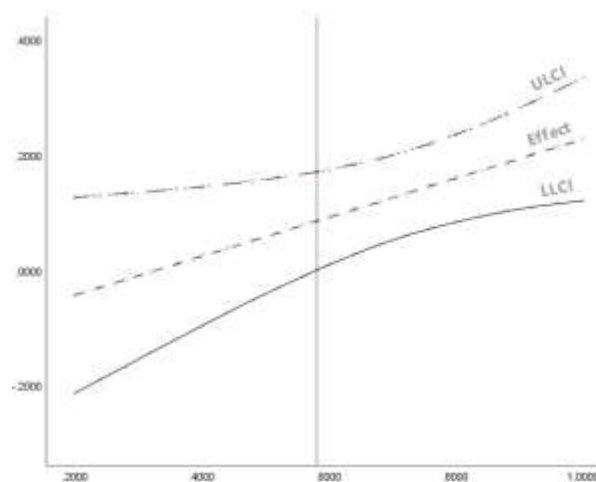
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constant and only becomes apparent when the improvement degree of the construction mechanism reaches a certain level.



Source: created by the authors.

Figure 2. Regulatory Effect Diagram



Source: created by the authors.

Figure 3. Johnson-Neyman Diagram of Regulatory Effects

Table 7. The Mediating Effect and Confidence Interval of the Bootstrap Method at Different Levels of Moderating Variables

Moderator Path	Moderator Variable : Construction Mechanism	Moderating Effect	95% Confidence Interval
Human Resources Investment → Development Level of Informatization	Low mechanism level(M-SD)	0.069	[-0.024,0.162]
	Medium mechanism level(M)	0.144	[0.070,0.217]
	High mechanism level(M+SD)	0.218	[0.117,0.320]
Capital Investment → Human Resources Investment → Development Level of Informatization	Low mechanism level(M-SD)	0.024	[-0.009,0.077]
	Medium mechanism level(M)	0.051	[0.002,0.103]
	High mechanism level(M+SD)	0.078	[0.003,0.142]
Capital Investment → Informatization Leadership → Human Resources Investment → Development Level of Informatization	Low mechanism level(M-SD)	0.010	[-0.004,0.039]
	Medium mechanism level(M)	0.022	[0.003,0.060]
	High mechanism level(M+SD)	0.033	[0.005,0.087]

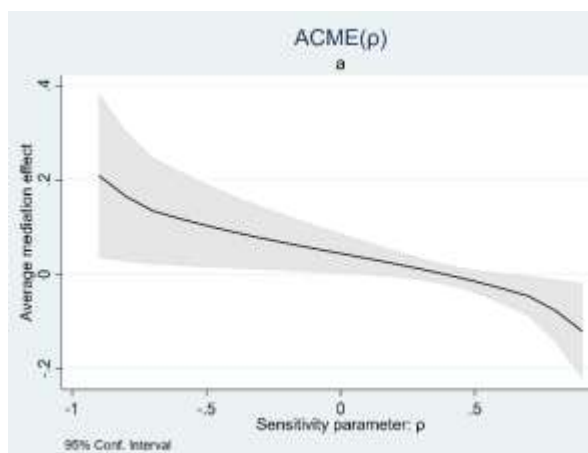
Source: own calculations.

Subsequently, the study examined the inclusion of various variables in Model 87 within the SPSS Process V3.5 plug-in to test for the moderated mediating effects, as shown in Table 7. The findings reveal that when the improvement degree of the construction mechanism is very low, the influence of capital investment on the informatization development level through human resources investment is $\beta=0.024(p>0.05)$, and the 95% confidence interval is [0.009,0.077], including 0. This indicates that the indirect effects are not significant. However, when the improvement degree of the construction mechanism is high, the influence of capital investment on the informatization development level through

human resources investment becomes significant ($\beta=0.078$, $p<0.05$), and H5b is true. Similarly, when the improvement degree of the construction mechanism is very low, the influence of capital investment on the informatization development level through leadership and human resources investment is not significant ($\beta=0.010$, $p>0.05$). However, when the improvement degree of the construction mechanism is high, the influence of capital investment on the informatization development level through leadership and human resources investment is $\beta=0.033$ ($p<0.05$), and the 95% confidence interval includes 0, indicating that there's moderated chained mediating effect, verifying H5c.

3.4 Robustness Checks

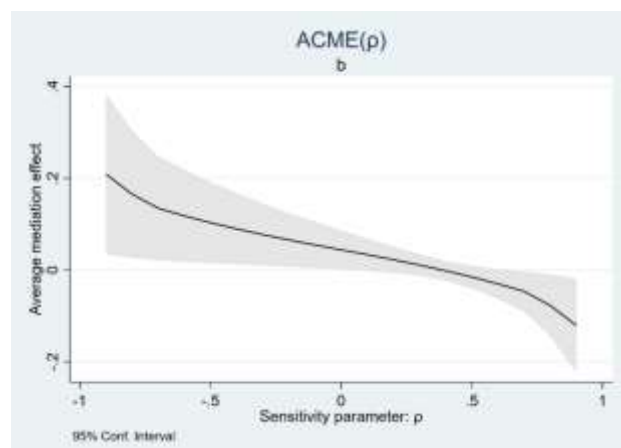
To improve the robustness of the conclusion, this article conducts a causal mediation sensitivity analysis, aiming to demonstrate how ACME varies with the sensitivity parameter p . When the mediating variable is leadership, the causal mediating effect of capital investment is 0.0438, and the mediating effect of leadership on the level of information technology development is 19.7%; The sensitivity analysis of the leadership causal mediation model is shown in Figure 4.



Note: when p is less than 0.38, the direction of ACME will remain unchanged.

Source: created by the authors.

Figure 4. The Sensitivity Analysis of the Leadership Causal



Note: When p is less than 0.38, the direction of ACME will remain unchanged.

Source: created by the authors.

Figure 5. The Sensitivity Analysis of the Causal Mediating Mediation Model of Human Resource Investment

When the mediating variable is human resource investment, the causal mediating effect of capital investment is 0.0676, and the mediating effect of human resource investment on the level of information technology development is 30.6%. The sensitivity analysis of the causal mediating model of human resource investment is shown in Figure 5. When p is less than 0.43, the direction of ACME will remain unchanged.

In summary, even if there is a certain deviation from the assumption of continuous and negligible mediation effects, the mediation effects of leadership and human resource investment still exist, which is consistent with the mediation analysis conclusion based on Bootstrap method in the previous text. Therefore, this result confirms that there is a potential causal mediating mechanism for the impact of

capital investment on the level of information technology development through leadership and human resource investment.

4. Discussion

By exerting a positive influence on the informatization development level, capital investment boosts the comprehensive level of universities and colleges in terms of the infrastructure, governance system, application ability, network security, and innovative development. The positive impact of capital investment on the informatization development level in colleges and universities is a notable finding that resonates with universal trends in higher education modernization. This highlights the global significance of financial inputs in facilitating digital transformation, an opportunity and challenge shared by academic institutions worldwide.

4.1 Capital Investment & Informatization Development Level

A robust capital investment constitutes the foundation for advancing educational informatization on a wide scale. As universities across the globe strive to integrate digital infrastructure into teaching, learning, and administration, the strategic deployment of financial resources emerges as a common prerequisite (Omodan, 2024). This indicates that the association between capital investment and informatization development has the potential to inform broader strategic planning and international educational policy. Owing to the substantial effect of government documents on the construction of education informatization in universities and colleges and their recent informatization practices, capital investment acts as a pivotal driver of the guaranteed measures. In universities and colleges of various levels, capital investment is also an “affirmatively chosen item” in the top-level plans and designs for informatization. Meanwhile, in a bid to enhance the informatization development level, increasing capital investment provides favorable financial support for design and planning, software development, equipment purchase, project implementation, and later-phase maintenance and operation of the informatization of universities and colleges. On a global scale, such insight offers practical guidance for policymakers and academicians striving to develop financially sustainable digital education systems that can address the emerging needs of the 21st-century knowledge economy. Thus, persistently channelizing capital investment for informatization and optimizing the mechanism of capital guarantee is a noticeable trend in the future efforts of colleges and universities (Han *et al.*, 2024). Further, this also acts as a core guarantee and fundamental condition for the development of informatization in higher education institutions.

4.2 The Moderating Effects of the Informatization Construction Mechanism

The construction mechanism plays an imperative role in the whole pathway. Firstly, “people” represents the purpose of the construction mechanism. Reportedly, complete institutions, norms, standards, rewards, and punishment measures are necessary for executing standardized, institutionalized, and normalized construction activities. The aforementioned elements serve to ignite the innovativeness as well as the initiatives of workers, allowing them to convincingly execute tasks while positively affecting the informatization development. Subsequently, a robust construction mechanism for informatization institutionally outlines the caliber and scale requirements for informatization workers. This ensures that more capital is directed towards caliber enhancement, business training, and personnel recruitment, in order to integrate human and school development. Concurrently, the involvement of various school departments in informatization construction is motivated through assessment, thereby boosting the cooperation and integrity fostered by informatization (Zhao *et al.*, 2024). Lastly, the improvement in the construction mechanism can reinforce the competency of HEIs in thoroughly planning informatization

development. Such an improvement facilitates coordination and communication among workers in different departments, stimulating leaders to consistently increase investment in human resources. This encompasses uplifting the proportion of full-time informatization staff, enhancing the information literacy of the personnel, mobilizing the initiatives and enthusiasm of workers, triggering their innovation capabilities, and advancing the overall informatization development in universities and colleges. These research implications transcend local boundaries, providing a blueprint for higher education institutions across the globe to refine their institutional framework and internal governance structures. Besides, effective construction mechanisms constitute universally applicable tools for scaling digital capacity and boosting sustainable digital education ecosystems.

4.3 Mediating Effects of Informatization Leadership and HR Investment

Primarily, informatization leadership in colleges and universities plays a partial intermediary role in the connection between capital investment and the information development level. In specific, informatization leadership refers to the integrative ability of the leaders to augment the efficiency of university development through their planning, management, and construction of schools with the aid of IT (Jing & Wu, 2022). Further, informatization encompasses imperative responsibilities such as guidance, planning, in-depth coordination, promotion, supervision, and appraisal of informatization development in higher education institutes (HEI). Such leadership not only influences the use and distribution of capital but also affects the rationality, feasibility, and effectiveness of the overall vision of informatization development in HEI (Leilei & Ruihua, 2016). Hence, informatization leadership is critical for capital investment to affect the mediating path of the informatization development level. Moreover, the persistent uplift in capital investment imposes higher requirements on leading universities, institutional implementation, and the functional division of informatization. Evidently, informatization leadership can only be constantly fostered through institutional innovation, function reorganization, and mechanisms' optimization, laying a solid foundation for the supervision, coordination, and promotion of informatization. Eventually, this upgrades the overall level of informatization development in universities.

Additionally, leaders, administrators, teachers, and students at HEIs serve as explorers, practitioners, innovators, and promoters of informatization construction and application (Devika, 2024). The strategic positioning and development of informatization in colleges and universities warrants interdisciplinary talents competent in management planning and overall coordination, and possessing higher information caliber. Meanwhile, a robust technical framework demands top-notch individuals with expertise in the underlying design and analysis of the information system. Similarly, the implementation of campus informatization applications and services necessitates professional talents with strong competencies in teaching, education, and management (Qintai, 2016). Accordingly, human resources emerge as a vital factor in the informatization development, as well as the caliber, awareness, competency, and proactive engagement of individuals are vital for the significant advancements of informatization in universities and colleges. Globally, strengthening these dimensions leads to developing adaptive, resilient, and future-ready institutions across diverse educational systems. Consequently, human resources investment should play a key mediating role for capital investment in affecting the informatization development level. Likewise, capital should not only be invested in the development of infrastructure and software/hardware equipment for informatization but should also be channeled to individual growth and team development. At the same time, investments must be made in supporting human resources, building core teams, and developing personnel echelons in management, technology, training, and applications.

Lastly, the informatization leadership of higher education institutes and human resources investment play a chained mediating effect on impacting the informatization development level. Certainly, substantial capital investment shall constantly bolster the university leaders' influence during the informatization construction and application. This infusion of funds shall activate the efficiency of educational organizations, making it convenient to realize the strategic goals of informatization. Concurrently, the enhancement of leadership in informatization shall further drive university leaders and decision-makers to reconsider the concern of human resource investment in informatization (Biswas *et al.*, 2024). With an in-depth comprehension of the HEI's informatization strategic development goals and direction, leaders shall persistently adhere to established objectives and show willingness to invest more in human resources, thereby building a favorable organizational leadership and an environment of human resource support (Bui *et al.*, 2024). Thus, both informatization leadership and human resources investment play a chained mediating role in the effect of capital investment on the informatization development level. The proposed dynamics strengthen the global call for integrated, multi-dimensional approaches to educational reform in higher education institutions, where leadership, workforce development, and technological setups are harmonized to maximize favorable influence while ensuring sustainability in higher education transformation. Correspondingly, colleges and universities should invest more capital in both and synchronously focus on the coordinated development of the two mediating factors. As a consequence, this will better translate financial investment into an optimization of the informatization development level.

Conclusions

This paper has systematically investigated the effect of capital investment on the informatization development of universities in China, exploring a multilayered and robust influential mechanism. The study findings reflect that financial investment acts as an imperative driver of informatization progress, directly optimizing institutional infrastructure, governance systems, network security, innovation, and application capabilities. Specifically, capital investment is not only a supportive measure but a key element in the operational execution and strategic design of informatization in higher education institutes. Furthermore, capital investment facilitates the development of digital platforms, long-term planning, procurement of advanced technologies, and sustained maintenance, making it an essential prerequisite for a successful digital transformation in universities. In a nutshell, this study accentuates that effective informatization in universities requires more than capital investment; it demands strategic human resource planning, strong leadership, and institutional mechanisms that convert capital into capacity. The aforementioned integrated efforts will serve as the cornerstone of high-quality, sustainable development for universities striving to thrive in an increasingly digital era.

Nevertheless, this study also reveals that the association between capital investment and informatization development in universities is not linear or unidimensional. The influence of capital investment is substantially mediated by human resource investment and informatization leadership. Meanwhile, leadership plays a crucial role in guiding the financial resources, ensuring that investments are in line with strategic priorities, and supporting institutional cohesion. Notably, leaders shape the vision, coordinate departmental activities, supervise implementation, and assess outcomes—functions imperative for transforming financial inputs into useful digital advancements. At the same time, human resource investment ascertains the practical effectiveness of informatization strategies. In particular, the full potential of financial investment cannot be realized without capable personnel, including IT managers, technical experts, skillful administrative staff, and educators proficient in digital tools. Hence,

universities must not only prioritize the recruitment, selection, and training of qualified personnel but also support interdisciplinary teams equipped with both technological and educational competencies.

In addition, the interaction between these mediators also manifests as a chained influence. Evidently, an uplift in capital investment reinforces the informatization leadership, which eventually escalates the institutional attention toward human resource development. Further, leaders who comprehend the strategic value of informatization are more inclined to divert resources toward developing competent teams, thereby promoting talent development and embedding digital practices into the institutional culture of higher education institutions. Therefore, leadership and human resource investments do not function in isolation but reinforce each other, optimizing the overall capacity of universities to realize their informatization objectives. Besides, the informatization development mechanism within universities moderates the complete pathway from capital investment to development outcomes. A sound mechanism—covering explicit operational standards, institutional norms, incentive systems, and accountability measures—acts to institute best practices and mobilize staff engagement. Certainly, well-defined procedures and sound organizational structure ensure that organizational resources are not only optimally allocated but are also utilized to their fullest potential. On the contrary, weak mechanisms undermine staff motivation, restrict institutional responsiveness, and hamper cross-departmental collaboration, eventually hampering the effectiveness of human and financial investments.

In light of these findings, the following recommendations are as follows. Firstly, although capital investment is fundamental, investment must be complemented by a strategic approach that integrates leadership development, human resource enhancement, and organizational reforms. For instance, universities must avoid reducing information to mere technological transformation or procurement of equipment. Instead, higher education institutions should employ a holistic approach that not only improves organizational competencies but also aligns capital investments with research needs and pedagogical goals. Secondly, substantial efforts must be undertaken to transform the capital investment mode from material-oriented approaches to people-centric strategies. Based on the global MIS models such as Stanford University's integrated CIO framework and multi-tiered governance of IT resources, universities in China should also institute leadership groups responsible for strategic planning, budgeting, and performance assessment. For instance, when academic leaders are appointed from among top academic institutions, they can act as pivotal actors in bridging the gap between technological development and the institutional vision of the universities.

Thirdly, human resources should be repositioned at the pivot of informatization planning. In addition to traditional IT staffing for operations and maintenance, universities need to develop diverse teams specializing in digital pedagogy, data analytics, system integration, and instructional design. Simultaneously, competitive compensation, professional development, and explicitly defined career trajectories incentivize innovation practices and uplift the digital services' quality offered to staff members and students. Lastly, the development mechanism for informatization requires further refinement. Particularly, establishing standardized frameworks for resource allocation, project assessment, and performance appraisal will allow universities to switch from fragmented efforts to cross-functional and cohesive initiatives. Moreover, a robust mechanism also enables the decentralization of informatization responsibilities, motivating different departments to take ownership of digital transformation instead of relegating it merely to IT units.

The key limitations associated with this study are as follows. In this study, the geographic scope is restricted to universities in one province (Zhejiang), which confines the results' generalizability. Future

studies should expand the data set to encompass different institutional and regional contexts. Additionally, this study relies on cross-sectional data, which captures static connections without accounting for temporal dynamics. Based on the multi-year data, longitudinal studies would provide an in-depth comprehension of causal relationships and developmental trajectories. With insufficient differentiation of investment types and limited gradation in funding categories, the index system used in this study for evaluating informatization is also comparatively coarse. Refining the scaling framework to distinguish between software, infrastructure, and human capital investment will facilitate policy guidance and more granular analysis.

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KAIP KAPITALO INVESTICIJOS GALI DIDINTI UNIVERSITETŲ INFORMACINIŲ TECHNOLOGIJŲ LYGĮ

Zhen Zhu, Mohammed A.M. AlGerafi, ShuFen Wan, CiXian Lu

Santrauka. Skaitmeninės švietimo transformacijos kontekste kapitalo investicijų didinimas, siekiant skatinti universitetų informatizacijos plėtrą, yra svarbi priemonė aukštojo mokslo kokybiškam vystymuisi. Tačiau vis dar trūksta sistemingo paaiškinimo ir demonstravimo, kaip lėšos veikia universitetų informatizacijos plėtros mechanizmą, logiką ir sąlygas. Tyrimo rezultatai atskleidė, kad kapitalo investicijos į universitetų informatizacijos plėtrą reikšmingai teigiamai veikia informatizacijos vystymosi lygį. Universitetų informatizacijos plėtros mechanizmas teigiamai reguliuoja ryšį tarp žmogiškųjų išteklių investicijų ir informatizacijos vystymosi lygio. Tyrimas atskleidė vidinį mechanizmą ir funkcinį kelią, kaip kapitalo investicijos veikia universitetų informatizacijos vystymosi lygį, suteikė naudingų įžvalgų universitetams, siekiantiems efektyviai panaudoti informatizacijos lėšas praktinei plėtrai.

Reikšminiai žodžiai: aukštasis mokslas; skaitmeninė transformacija; kapitalizacijos metodas; veiksmų mechanizmas; tvari informatizacija.