

MODEL FOR IMPROVING THE INFORMATION  
LEADERSHIP OF MIDDLE-LEVEL ADMINISTRATORS  
OF PUBLIC UNIVERSITIES IN ZHEJIANG

ZHANG WENMING

A thesis submitted in partial fulfillment of the requirements for  
the Degree of Doctor of Philosophy Program in Educational Administration


Academic Year 2023

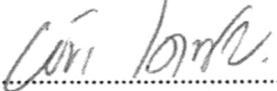
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**Thesis Title** Model for Improving the Information Leadership of Middle-level Administrators of Public Universities in Zhejiang

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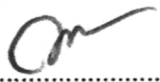
  
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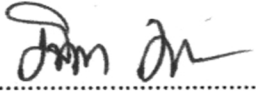
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### ABSTRACT

The objectives of this research were: 1) to study the current situation of information leadership of middle-level administrators in public universities in Zhejiang, 2) to develop model for improving information leadership of middle-level administrators in public universities in Zhejiang, and 3) to evaluate the adaptability and feasibility of model for improving information leadership of middle-level administrators in public universities in Zhejiang. The interviewees were 10 high-level administrators come from of 5 public universities. The evaluation administrators were 9 high-level administrators, The research instruments were document analysis, questionnaire, structured interview and evaluation form. The statistic to analyze the data were percentage, mean, standard deviation and content analysis.

The results were found that 1) The current situation of information leadership of middle-level administrators in five aspects was at high level. The model for improving information leadership of middle-level administrators in five aspects, which contained 32 measures. 3) The suitability of model for improving information leadership of middle-level administrators in high level.

**Keywords:** Model for Improving Information Leadership, Middle-Level Administrators, Public Universities in Zhejiang

ชื่อเรื่อง	รูปแบบการปรับปรุงภาวะผู้นำสารสนเทศของผู้บริหารระดับ กลางของมหาวิทยาลัยรัฐในมณฑลเจ้อเจียง
ชื่อผู้วิจัย	จาง เหวินหมิง
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อาจารย์ที่ปรึกษาหลัก	รองศาสตราจารย์ ดร.นิรันดร์ สุธีนิรันดร์
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ปีการศึกษา	2566

### บทคัดย่อ

การวิจัยครั้งนี้มีวัตถุประสงค์ 1) เพื่อศึกษาสถานการณ์ปัจจุบันของความเป็นผู้นำด้านสารสนเทศของ ผู้บริหารระดับกลางในมหาวิทยาลัยของรัฐในเจ้อเจียง 2) เพื่อพัฒนารูปแบบการปรับปรุงความเป็นผู้นำด้านสารสนเทศของผู้บริหารระดับกลางในมหาวิทยาลัยของรัฐในเจ้อเจียง และ 3 ) เพื่อประเมินความสามารถในการปรับตัวและความเป็นไปได้ของแบบจำลองในการปรับปรุงความเป็นผู้นำด้านข้อมูลของผู้บริหารระดับกลางในมหาวิทยาลัยของรัฐในเจ้อเจียง ผู้ให้สัมภาษณ์คือผู้บริหารระดับสูง 10 คน มาจากมหาวิทยาลัยของรัฐ 5 แห่ง ผู้บริหารการประเมินผลคือผู้บริหารระดับสูง 9 คน เครื่องมือที่ใช้ในการวิจัย ได้แก่ การวิเคราะห์เอกสาร แบบสอบถาม การสัมภาษณ์แบบมีโครงสร้าง และแบบประเมินผล สถิติในการวิเคราะห์ข้อมูล ได้แก่ ค่าร้อยละ ค่าเฉลี่ย ส่วนเบี่ยงเบนมาตรฐาน และการวิเคราะห์เนื้อหา

ผลการวิจัยพบว่า 1) สถานการณ์ภาวะผู้นำสารสนเทศของผู้บริหารระดับกลางทั้ง 5 ด้านในปัจจุบัน อยู่ในระดับสูง รูปแบบการปรับปรุงภาวะผู้นำสารสนเทศของผู้บริหารระดับกลาง 5 ด้าน มี 32 มาตรการ 3) ความเหมาะสมของรูปแบบการพัฒนาความเป็นผู้นำด้านสารสนเทศของผู้บริหารระดับกลางในระดับสูง

**คำสำคัญ:** แบบจำลองการพัฒนาความเป็นผู้นำด้านสารสนเทศ ผู้บริหารระดับกลาง  
มหาวิทยาลัยของรัฐในเจ้อเจียง



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Zhang Wenming

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# Chapter 1

## Introduction

### Rationale

Since the beginning of the 21st century, the extensive integration of information technology across various societal domains has fundamentally transformed social relationships and structures, making "information" a defining characteristic of our era. As a result, research and application surrounding "information" have gained significant prominence. Zhao Feilong (2013, p.49) emphasizes that effective information leadership must align with and leverage contemporary characteristics to bolster educational organizations in maintaining competitive advantages and fostering growth. To cultivate effective information-based leadership, it is crucial for educational leaders to seamlessly integrate their practices with the tools of the digital age. In practice, both the development and implementation of information initiatives are influenced by the leadership's proficiency in information technology, which ultimately impacts the viability of educational organizations in an information-driven society.

In China, the push for educational information has reached a national strategic priority. The ongoing evolution of educational information in the country is widely recognized for its "revolutionary" effects on teaching and learning. The concept of "information-based leadership" has garnered substantial national attention and has been incorporated into educational practices. The Ministry of Education has frequently referenced "information leadership" in documents such as the "Education Information 2.0 Action Plan" and the "10-Year Development Plan for Educational Information (2011-2020)." Despite the ongoing advancements in smart university initiatives, the integration of information technology with education continues to deepen, and the ecological development of education is constantly evolving. It is essential to acknowledge that educational participants are foundational to development and innovation; technology serves merely as a tool, with the "human" aspect of information being particularly



critical. The information-based leadership of these participants significantly influences the depth and quality of smart university initiatives.

Jiang Zhihui (2015, p.5) highlights that the nationwide implementation of the "three links and two platforms" (which include online learning spaces like "Everyone," high-quality resources such as "Class," and broadband networks designated as "University," alongside education management and resource public service platforms) signifies that China's educational information landscape is undergoing a transformative phase. This period is characterized by simultaneous advancements in hardware, software resources, fundamental applications of educational information, and educational reforms, transitioning from individual-level applications of information technology to reforms in organizational structures.

Hua Fang (2010, p.105) notes that, in this historical context, the progression of information technology in higher education in China presents various strategic options. Externally, factors such as national policy formulation, social demands, and technical support play a role, while internally, it relies on the development of university presidents and the reform of teaching methods. As a crucial "window" and leader in China's reform, Zhejiang must prioritize higher education information.

Wang Shuhua (2022, p.105) points out that whether influenced by external societal impacts or internal transformations, middle-tier universities have become more agile and autonomous in the higher education system's reform. The role of middle-level administrators is indispensable in the educational information landscape. Despite this, there is a notable lack of research focusing on the information leadership of these administrators, with existing literature seldom addressing this group's contributions. Investigating the value, subjectivity, and practicality of their information leadership—including its structural dimensions, influencing factors, dynamic mechanisms, capability preferences, and development stages—has become critical for the high-quality advancement of educational information.

Wang Jie (2013, p.48) remarks that the emergence of technologies such as cloud computing, big data, the Internet of Things, artificial intelligence, MOOCs, SPOCs, mobile teaching, flipped classrooms, and blended learning presents both challenges and opportunities for educational stakeholders. Effectively merging these new

technologies and theories with leadership capabilities to enhance institutional information leadership is an essential requirement for all educational participants involved in the establishment and application of smart universities. Presently, scholars globally are looking to university leaders and middle-level administrators to address challenges in educational information development. Research indicates that these administrators possess the necessary qualifications and responsibilities, utilizing their information literacy and leadership to guide information initiatives that align with local contexts, facilitating significant progress in educational reform.

In conclusion, China's educational information sector is currently navigating a critical transitional phase, with middle managers in higher education serving as pivotal decision-makers in smart campus development. Elevating the information leadership of these managers is crucial for successfully establishing and applying smart campuses, as their values, decision-making abilities, and comprehensive management skills directly influence the trajectory and success of these initiatives. Therefore, this paper aims to develop a model of information leadership for middle managers, which will be the central focus of this research.

## Research Questions

1. What is the current situation of information leadership of middle-level administrators in public universities in Zhejiang?
2. How to develop model for improving information leadership of middle-level administrators in public universities in Zhejiang?
3. Is the model for improving the information leadership of middle-level administrators in public universities in Zhejiang adaptability and feasibility?

## Objectives

1. To study the current situation of information leadership of middle-level administrators in public universities in Zhejiang.
2. To develop model for improving information leadership of middle-level administrators in public universities in Zhejiang.

3. To evaluate the adaptability and feasibility of model for improving information leadership of middle-level administrators in public universities in Zhejiang.

## **Scope of the Research**

### **Population and Sample Group**

#### **Population**

The research were 440 middle-level administrators from 5 public universities in Zhejiang.

#### **The sample group**

According to Krejcie and Morgan sampling table, the sample group of this research was 205 middle-level administrators from 5 public universities in Zhejiang. By using stratified random sampling and sample random sampling was also used by drawing from universities in Zhejiang.

The interviewees in this research were 10 high-level administrators in public universities in Zhejiang. The qualifications of interviewees are as follows: : 1) high-level administrators of secondary universities of public universities in Zhejiang; 2) the regional distribution of universities and universities should be more reasonable and balanced; 3) the tenure of the high-level administrators shall not be less than 3 years, and the distribution of the high-level administrators individual characteristics such as gender, age, professional background and tenure shall be reasonable.

The experts for evaluation of the adaptability and feasibility of model for improving the information leadership of middle-level administrators were 9 high-level administrators in public universities in Zhejiang. The qualifications of the experts are as follows: 1) at least 5 years of work experience in high-level administrator in public universities, 2) have extensive experience in information leadership, 3) graduated with doctor's degree, 4) academic title is associate professor or above.

### **The Variable**

According to the analyzed of related theories and related researches, information leadership of middle-level administrators are as follows.

1. Information literacy
2. Information vision

3. Information construction and management
4. Information-based evaluation
5. Organizational atmosphere

## Advantages

1. This paper theoretically studies and discusses the influential factors of information leadership of middle administrator in universities, and establishes a good research model of information leadership.

2. It effectively expands the research vision and research boundary of the influential factors of information leadership of middle administrator in universities, and deepens the research mechanism of the influential factors of information leadership of middle administrator in universities.

3. Enriched the measurement of information leadership of middle administrator in universities, and provided strong support for middle administrator in universities to carry out self-assessment and scholars to carry out further research;

4. The effectiveness of the design experiment is demonstrated to prove that the promotion strategy and operation path proposed in this study can play a good role in motivating and promoting middle administrator in universities to improve their information leadership level.

## Definition of Terms

**1. Information Leadership** refers to the process of optimizing and improving the workflow, methods, performance and other aspects of individuals or organizations by using modern information technology means, including 1) information literacy, 2) information vision, 3) information construction and management, 4) information-based evaluation, 5) Organizational atmosphere.

**2. Information Literacy** refers to middle administrator in universities with high information literacy should have a certain degree of information awareness, master abundant information technology knowledge and skills, and be able to communicate effectively with teachers, students and stakeholders by means of information technology.

**3. Information Vision** refers to based on the basic premise of promoting the development of university education information, middle administrator of universities lead the majority of teachers and students to scientifically evaluate the future development trend of basic education information on the basis of in-depth analysis of the current situation of university information construction, and according to the national strategic decision-making and the spirit of relevant documents, It makes a comprehensive and stratified plan for the construction of information infrastructure, the construction and allocation of information resources, the investment of information construction funds and the information management mechanism of the university.

**4. Information Construction and Management** refers to the private help provided by leaders for employees in the life and production process, so that employees can carry out production operations in a good living environment, so that they have no future, which can greatly improve the innovation ability of employees and give them more opportunities and mentality to carry out enterprise innovation activities.

**5. Information-Based Evaluation** refers to it mainly includes the construction of university information resources, university information education and management, and university information culture construction. The construction of information resources is mainly embodied in the construction of information human resources, information teaching resources and information learning platform.

**6. Organizational Atmosphere** refers to the subjective perception and feeling of individual members of the organization on the organizational behavior environment, which is the sum of the attributes of multi-dimensional work environment based on the perception of members.

**7. Public University** refers to academic universities, application-oriented general undergraduate institutions In this study, " universities" are defined as: academic universities, application-oriented general undergraduate institutions, and vocational and technical public universities in Zhejiang.

**8. Middle-Level Administrators** refers to the deans, vice deans, or individuals responsible for information construction in general undergraduate vocational and technical colleges of public universities in Zhejiang.

### Research Framework

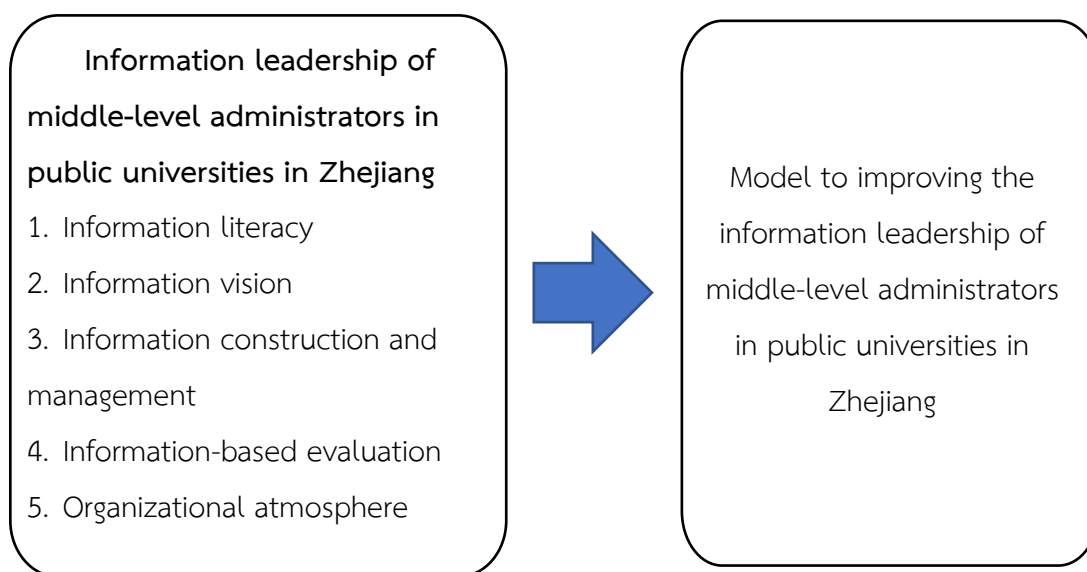


Figure 1.1 Research Framework

## Chapter 2

### Literature Review

International society for technology in education (LSTE) in the national education technology standard for administrator (NETSA 2009) in education management information structure model of leadership, think its structure include: Leadership and vision learning and teaching, and protection, management and operation, social, legal and moral issues five aspects. British national college for university leadership (NCSL) pointed out that information leadership mainly includes three aspects: Vision, implementation, and evaluation; among them, "Vision" Includes that leaders should have the skills and knowledge needed to carry out planning, and let all members understand the importance of planning; "Application" Includes how to innovate educational information, how to integrate information technology into the process of teaching and learning, and how to continuously and effectively apply information technology to improve the quality of life of students and teachers. "Evaluation" Includes the review of resources, the evaluation of construction and the supervision of application.

1. Concept of educational administration
2. Concept of leadership and information leadership
3. Contexts of public universities in Zhejiang
4. Related research

#### Concept of Educational Administration

Educational administration is about management in a "standard" environment that does not exist in real life. The educational organization in the "standard" environment is an unrealistic closed system, which tries to eliminate the influence of various non-educational factors in the external environment, and simplifies the complex social environment system and the educational system into a number of basic elements and their relations.

Dong Chuncai (1985, p.166) Encyclopedia of China Education explains the nature of educational management from the perspective of function and significance, and noted that in socialist countries, educational management needs to serve the construction of educational undertakings in socialist society, that is, to "maintain and adapt to the socialist relations of production and social system, implement socialist democracy management, and apply the laws of scientific ideological and political work." Adjust the relations among the people and mobilize the maximum enthusiasm of people ", and ultimately improve the quality of education.

Wu Zhihong and Feng Daming (2007, p.37) continue the idea that education management serves the national education cause. From the perspective of significance, they noted that the purpose of education management is not only to guarantee "the right of all citizens to receive education", but also to realize the "national education concept" and create conditions for the development of China's education cause. Although the subjects and means of educational management are different, the ultimate goal is to improve the quality and efficiency of education in China, which is mainly based on the policies and laws of the Party and the state.

Wu da wei. (2013, p.21) also hold this view. The Dictionary of Education edited by Professor Gu Mingyuan (1990, p.93) defines educational management as "the organization, leadership and management of educational undertaking and university by the state or local government", and points out that educational management activities are divided into educational administration and university management, and the basic tasks of the two are also divided. Among them, education administration is more at the national macro level, that is, serving the construction of national education, including adjusting various proportional relations within education and formulating education development plans. university management, on the other hand, returns to the micro-level of the university. The main contents include the near, medium and long-term development planning of the university, the management of teaching quality, financial management and general affairs. Compared with educational management, educational management as a discipline is a science that scientifically summarizes the experience and thoughts of educational management activities, reveals the laws of educational management activities, and guides the development



of educational management in the future. At the same time, the development of educational management can not be separated from the conduct of educational management activities. In reviewing a "forgotten discipline".

Kong Fan (2023, p.49) noted the education "explanation is this: education management (educational administration) is a branch of education science. Before the founding of the People's Republic of China, it was called educational administration. The explanation of the encyclopedia gave a basic tone to the educational management before the founding of the People's Republic of China, and many scholars still use this view. In the Dictionary of Education, educational administration is explained as "a component and branch science of educational management." Before the founding of the People's Republic of China, it was equivalent to educational management." In the interpretation of educational management, the dictionary points out two kinds of meanings, that is, educational management refers to both the study of educational administration and university management work laws, and refers to educational management courses, that is, "to train educators and educational management workers as the goal of the relevant institutions (mainly normal colleges) offered courses in education management." In his book *Educational Management: Concepts and Principles*, Huang Wei sorted out and summarized the opinions of domestic scholars in the 1980s and 1990s, which were mainly divided into two categories. First, educational management is regarded as a science to study the process and law of educational management, and educational management is divided into educational administration and university management.

Chen Xiaobin (1999, p.50) noted "Educational management is a science that studies the process and laws of educational management." From the object of study, the educational management is divided into broad sense and narrow sense. The broad sense of educational management takes national educational management system as the object of study, while the narrow sense takes university organization as the object of study. Other scholars have put forward similar views. Second, educational management is regarded as a science that studies the phenomenon and essence of educational management and reveals the law of educational management.

Sun Miantao (1999, p.23) noted educational management is a science that studies the phenomenon of educational management and reveals the law of educational management. "Wu Zhihong, Feng Daming (2007,p.39) and others criticized the practice of dividing educational management into two in the past, arguing that this practice "actually leaves educational management on the ground and no longer regards it as a separate discipline". They pointed out that educational administration and educational management should be treated equally, and educational management should be treated as an independent discipline. In addition, it also points out that university management is the core of educational management research. The subjects of the study criticized that such topics were empty and "neither worthwhile nor necessary." Based on the phenomenon view of educational management that combines reality, understanding and criticism, he put forward: "Educational management is a science that recognizes and understands the phenomenon of educational management and seeks ways to improve educational management."

Daniel Wren (1958, p.153) noted that educational management is a practical activity involving the daily operation of university, and educational management is also a discipline. Management is a large professional category, according to the different fields, can be subdivided into engineering management, military management, business management, public utility management and so on. Educational management is the management activity that people engage in in the field of education, which belongs to the management of public undertakings. He summarized the disputes in the western educational management circle as the opposition between "universality" and "particularity". Scholars who hold the "universality" view "often assume that management is based on common factors, regardless of the institutional background", and noted that the general principles of management can be applied to all organizations, and there is no fundamental special particularity between educational management and other management. Glatter (2010, p.663) points "Educational institutions differ markedly from other types of organizations... The training of educational administrators should be linked to their specific management activities."

Sun Miantao (1999, p.22) noted that the surname of educational management is "Jiao" rather than "Guan", which is actually an extreme manifestation

of the above-mentioned "particularity" view, that is, one-sided emphasis on the educational nature of educational management. For the dispute between "universality" and "particularity", or the question of whether educational management is "teaching" or "management", we advocate the "particularity" view, that is, educational management is a very special activity influenced by both education and management. The reason why we think so is because, in our view, as a specific field of management, educational management must accept the guidance of general management principles, and there is something in common with other management activities, "like other management activities, educational management activities should be restricted by social and historical conditions, the object of educational management is also people, money, things, things, time, space and other components Educational management is also manifested as a process, and has its special management functions, and its management mode changes with the changes of The Times, etc." First of all, he made a scientific understanding and profound analysis of Marx's judgment on the duality of management, and on this basis pointed out that Marx's discussion is not about the essential attribute of management, but about the attribute of management. The attribute of management mentioned by Marx is not the unity of naturalness and sociality, but the unity of commonness and individuality. He noted that educational management has two attributes, that is, commonness and individuality. Based on the analysis of the relationship between the attributes of education and the essential attributes of education, he deduced the essential attributes of education management from the attributes of education management

Wu Zhihong (2007, p.41) noted that the differences between educational management activities and other management activities are mainly reflected in the following aspects: many things in the field of education are difficult for people to determine or grasp, such as educational purpose, teaching skills, learning attitude and learning atmosphere. Because of the lack of conclusion on these things, educational administrators sometimes find it difficult to translate them into concrete and feasible operational plans. Education is entirely a cause of cultivating people, and the development of people is subject to many factors, which makes many aspects of educational management difficult to quantify, and directly affect the standards of

evaluation. Education is a highly valued enterprise, so educational management activities often involve ethical, moral and value issues that are not commonly encountered in other management activities. This characteristic of education determines that educational management is not a simple technical problem. In the education system, there are signs of increasing specialization in teaching. Teaching staff often want more freedom in their own fields, so educational administrators are dealing with a group of professionals who do not need strict control and management, so there is often conflict between them. The evaluation of the effectiveness of educational management is more complicated than that of other management work. This difficulty in performance evaluation adds difficulty to the successful performance of educational management functions. Education involves thousands of families and easily becomes the focus of social attention. This characteristic often makes educational management tend to be conservative and adopt a very cautious attitude in formulating educational policies.

Chen Xiaobin (1999, p.1220) pointed out in his book *Educational Management*, educational management behavior is subject to the political constraints of a country or region, and is "governed by the educational values of the leaders of the educational management department." In addition, in modern society, education management is not the responsibility of education management departments, some non-education departments also undertake the task of education, so naturally there is also the responsibility of education management. Regarding the concept of educational management, from the initial division of educational management into two, to insist on the integrity of educational management; From the focus on the research object of educational management to the call of some scholars to shift their attention to seeking ways to improve educational management, it can be found that as a subject with strong application, scholars' opinions on the concept of educational management are constantly developing and profound, and practice-oriented is the main direction of current research on educational management. Other scholars put it in the book *Modern Educational Management*, "Educational management is a complex science that studies the phenomenon of educational management and explores the laws of education". This definition highlights the practice-oriented and problem-

oriented characteristics of educational management. That is to study what measures to take under what conditions can stimulate the positive elements in education, crack the hot and difficult problems in education, improve education services, and enhance education quality. This article follows this definition.

In conclusion, educational management is a science that studies the process and laws of educational management. According to the characteristics of educational management objects, there are broad and narrow divisions. The general education management is the management of the whole national education system as its research object. Educational management in a narrow sense: it takes a certain type of university organization as its research object. Understanding the particularity of the above educational management activities will be of great benefit for us to further deepen our understanding of the essence of educational management, overcome the shortcomings of neglecting and combining the characteristics of educational management ethics in previous studies, and improve the scientificity of educational management ethics research.

## **Concept of Leadership and Information Leadership**

### **1. Leadership**

Leadership and management

In the study of leadership theory, "leadership" is a very common but very important concept. To clarify the basic connotation of "leadership" is the logical starting point for the study of leadership theory. Therefore, almost all leadership researchers try to explain and define the meaning of "leadership". noted literature review, this study finds that although definitions given by different scholars differ in their perspectives, contents and forms, each definition well reflects scholars' cognition and experience. A stratified review, induction and analysis of these concepts and definitions is an essential part of leadership related research.

Liu Yongfang (2016, p.44) noted that "leadership refers to the authority and decisions exercised by leaders". And noted that "the essence of leadership is a form of rule, which is more or less voluntarily accepted by the leader under the influence of the leader".

Erry (2000, p.28) put forward that "leadership is the behavior that influences team members to voluntarily make efforts to achieve organizational goals". And points out, "Leadership is the process of motivating subordinates to conduct activities in a given way." Pierce (2004) argues that "leadership is actually a process, a process in which the leader exerts an effect on the members of the organization and pushes them to work towards a common goal". Jillian Rodd (2006, p.10) defines the concept of leadership in his book *Leadership in Early Education* as: "Leadership can be described as the process by which leaders set specific standards and expectations and influence others to act in the direction of established goals."

Tannenbaum (1961, p.362) put forward that "leadership is an influence to achieve a certain goal noted the exchange of views under certain circumstances". Argyris (1996, p.615) pointed out that "leadership is effective influence, and to ensure the effective implementation of leadership, leaders need to have a deep understanding of their ability to influence." From the etymological point of view, The opposite of the concept of "leadership" is "management". "management" is a word that appears along with industrial production. In modern society, management is everywhere. Especially since management became an independent science at the end of 19th century and the beginning of 20th century, people interpret management phenomenon from different perspectives.

Herbert A Simon (1982, p.166) argues that "management is decision-making". This view mainly emphasizes the importance of decision-making, and noted that if the decision is wrong, no matter how good the management is, it will even lead to higher management efficiency and greater losses. This study noted that management includes decision-making, but management is not exactly equal to decision-making.

James H Donnelly (1982, p.91) et al noted that "Management is a variety of organizational activities implemented by a single or multiple organization members to coordinate his/her people in order to achieve work results that cannot be achieved by individual activities alone". The point of view focuses on organizational activities in which individuals coordinate others to carry out effective work. There are elements in management that coordinate the activities of others to achieve organizational goals.

It should be noted, however, that management is not merely, or chiefly, the activity of objects.

Daniel Wren (1985, p.153) , "Management is the exercise of certain individual functions in order to efficiently allocate, acquire and apply human and material resources in order to effectively achieve the established goals of the organization." Of course, effective management behavior in an organization is an "intangible resource", and using this "intangible resource" can accelerate the realization of organizational goals. However, if the role of control is denied in the specific management process, it will not be able to play its measuring and correcting function in the process of implementing organizational goals, and the results will easily deviate from the established goals. Management is the process noted which employees make work well. On the one hand, this view does not highlight the important position of the main body of management (manager) in the whole management process, on the other hand, it does not point out the essential problem of the goal of management and why management is implemented.

Based on the above views, we noted that management is a dynamic and creative activity in which administrator effectively integrate and allocate organizational resources (people, money, materials, time and information, etc.) to achieve the established development goals of the organization. The core of management lies in the effective integration of organizational resources. The so-called effective integration means that under the guidance of the established development goals of the organization, the division of responsibilities of all staff is clearly defined, and on this basis, the reasonable distribution and use of people, money and things are realized, so as to ensure that the organizational system is always in the best running state.

In conclusion, Leadership and managers are closely related, and in fact, in many cases, effective managers also demonstrate strong leadership. The leader sets the direction, while the manager ensures that the plan is executed methodically to achieve those goals. The leader influences the team through charisma and shared vision, while the manager uses the authority given by the organization to direct and control. Leaders make strategic decisions at critical moments and lead change;

Managers are responsible for refining these decisions, developing specific action plans, and overseeing the implementation process to ensure efficient operations. Good leaders and managers value the growth and development of their team members. Leaders develop potential through motivation, while managers develop talent through training, coaching, and performance management. Leadership and management complement each other, and successful managers usually have strong leadership. In practical work, the integration of the two can greatly improve team effectiveness and organizational competitiveness.

#### Leader and leadership

Leadership has always been a hot topic that people talk about and pay attention to. People have tried to explain leadership from different perspectives, such as trait, behavior, influence and role positioning. However, due to the inherent complexity of the essential connotation of leadership, up to now there has not been a specific and widely accepted definition in the academic world, and I am afraid it will be difficult to emerge in the future.

Fred Fiedler (1971, p.435) argued that "there are many concepts of leadership, the number of which is almost equal to the number of leadership theories, and the number of leadership theories is almost equal to the number of researchers in the field of leadership". Despite the lack of a unified definition, it is necessary to stratifiedally analyze and examine the connotation of leadership before conducting research on issues related to leadership.

For the definition of the concept of leadership, there are two mainstream academic viewpoints: "ability theory" and "process theory".

1. As for the view of "competence theory", early scholars who held this academic view mainly studied and discussed leadership as a leader's personal ability. Kouzes and Posner (2012,p.49) noted that leadership is the ability of a leader to motivate and motivate subordinates to voluntarily make outstanding contributions in the organization. Dong Wenqi (2005,p.212) noted that leadership is a necessary requirement for the basic ability of a leader who can effectively influence the behavior of others and has corresponding management authority in an organizational system. Huo Guoqing (2010,p.38) pointed out that leadership is the ability of a leader



to effectively attract and influence subordinates and all stakeholders in a specific context to continuously achieve the set development goals of a group or organization.

2. On the "process theory" viewpoint. As for the expression of "process theory", Hersay Paul (2006,p.171) , founder of the Center for Leadership Studies, pointed out that leadership is an organizational process in which leaders carry out continuous and effective influence on others. John Garder (1965,p.12) pointed out that in principle, the definition of leadership can be defined according to the following two points: first, the interaction between leaders and subordinates and the results formed under this interaction; Second, the leadership process can be explained noted the personality traits of leaders, cognitive habits of leaders and followers, and organizational context. Du Yuan and Liu Meifeng (2009, p.469) pointed out that leadership is an organizational process in which administrator define organizational development goals for the team and all members of the organization, and exert influence on the members noted specific organizational behaviors to make them voluntarily accept and strive for the team goals.

In conclusion, we noted that there is a high degree of consistency between the concepts of "Leadership" and "leadership" in essence, and leadership and leadership are both represented by the word "leadership" in English. Therefore, for a long time, China only had leadership without the concept of leadership. However, in recent years, more and more scholars have begun to use the term leadership. This researcher noted that it is very necessary to put forward and use the concept of leadership: First of all, "power" as a physical concept has been widely accepted in the Chinese context, such as competitiveness, vitality, combat effectiveness, influence and labor force, so the term "leadership" is also easy to be understood and accepted by people. In addition, the Chinese Leader is often understood as leader, which makes it easy to simply understand the leader as "the implementer of position power". The use of leadership doctrine can more vividly reflect the "effectiveness" or "effectiveness". In addition, it should be noted that "leadership" should not be used as a verb, but only when "leadership" is used as a noun and does not refer to an individual.

## 2. Information Leadership

Information leadership originated from the end of the 20th century to the beginning of the 21st century. With the rapid development and wide application of information technology, organizations gradually realized the key role of leaders in guiding the information revolution. The concept has been influenced by theories in the fields of Management information systems (MIS), information technology Management (IT Management), and Knowledge Management. As a result, scholars and practitioners have begun to explore and define information leadership as a new type of leadership that emphasizes the specific skills and vision needed to successfully lead organizations in the information age.

Theo Haris (2018, p.72) concluded noted the experiment that if we focus on race, class, gender, disability, sexual orientation and other historically marginalized factors, we can create a more equitable and just environment for university, which is conducive to promoting the practice of university information leadership. International researchers have studied the degree of self-perception of college deans' information leadership and the impact of individual differences on their ability.

Erhan Unal (2015, p.247) investigated the perceived level of leadership self-efficacy of 320 university administrators. To test whether there are significant differences in their information leadership level in university level, professional qualifications and participation in on-the-job training programs. Positive emotion leadership and strategic resource leadership are also indispensable factors of university information leadership, and these two functions are related to the information leadership of the university senior and middle levels. Other studies hold that positive emotional guidance is a supportive cultur, including humanized consideration, encouragement, recognition and care. Managing and providing resources is a very important aspect of information leadership.

Wu da wei (2013, p.21) noted the study found that the university information leadership is the key driving factor is the official leadership positions and professional knowledge as well as the support of senior management and the interpersonal collaboration between leaders and senior administrator always perform Transformation Leadership, While middle administrator usually perform instructional

leadership, upper middle administrator are best able to provide emotional leadership to those they lead. And divides the information-based leadership of middle administrator in universities into five dimensions, namely, "information-based vision, information technology and infrastructure construction, member training and development, interpersonal relations and communication skills, and research evaluation".

Du Yuan and Liu Meifeng (2009, p.491) , after decoding the information-based leadership of middle administrator in universities, proposed that middle administrator in universities should have nine key behaviors in information-based leadership: To "take responsibility, guide and evaluate classroom instruction, develop and share a common vision of information technology, enhance personal influence, allocate university resources scientifically, provide technical support to teachers and students, motivate teachers, collaborate with others and understand the external environment and obtain relevant support" .

Wang lei (2015, p.76) jointly proposed that the information leadership of middle administrator in universities should mainly be reflected in four aspects: "information decision-making and vision planning ability, information consciousness and information technology application ability, information organization and management ability, and information evaluation and promotion ability." Among them, the information consciousness and information technology application ability of middle administrator in universities are the basis and support for the other three aspects of information leadership ability of middle administrator in universities."

Sun Zhenxiang (2010, p.3) summarized the existing research conclusions and pointed out that the information-based leadership of middle administrator in universities should include two basic dimensions: "leadership authority composition of middle administrator in universities" and "individual influence composition of middle administrator in universities". Among them, the dimension of "leadership authority composition of middle administrator in universities" includes five aspects: university information system construction, university information human resources construction, university information teaching application management, university information application experience summary and construction of university information culture

atmosphere. The dimension of "composition of personal influence of middle administrator in universities" mainly refers to the information literacy of middle administrator in universities, including the information consciousness of middle administrator in universities, the sense of responsibility in the information society, the application ability of information technology, the concept of transmitting information vision planning and the interpersonal communication ability under the information background.

Hua Fang (2010, p.104) adopted the literature method to study the information-based leadership of middle administrator in universities and found that The information-based leadership of middle administrator in universities is mainly composed of six aspects: "information-based vision planning ability, information-based management and evaluation ability, information-based literacy, information-based application guidance ability, information-based communication and coordination ability and information-based vision planning and construction ability". On this basis,

Wu Haiyan (2011, p.79) argue that "The leadership of education information of middle administrator in universities should mainly include five dimensions: researching and formulating the vision and plan for the development of university information, constructing and maintaining the education information technology environment, leading the professional development of teachers based on information technology, constructing public relations in the development of education information, and researching and evaluating the benefits of education information."

Zhao Leilei (2017, p.44) analyzed and interpreted the basic composition of information leadership of middle administrator in universities from four dimensions: "information vision planning ability, information technology application ability, information education management ability and information evaluation and promotion ability". Among them, the ability of information vision planning is mainly reflected in the formulation of information development vision planning, the formulation of information technology and classroom teaching integration plan, the formulation of research plans to improve teachers' information technology application ability and the formulation of information rules and regulations system. The application ability of information technology mainly includes the ability of middle administrator in

universities to perceive, use and think about technology. The ability of information-based university-running management mainly includes five aspects: promoting teachers' information-based classroom teaching, optimizing campus information-based learning environment, promoting information-based management, establishing and improving information-based rules and regulations, and organizing teachers to carry out information-based training. The ability to promote information evaluation is mainly reflected in organizing specialized manpower to conduct regular evaluation on four aspects: subject information teaching, student information learning, university information environment construction and university information system.

Dai Ruihua and Zhang Lilian (2019, p.235) proposed that The information governance ability of middle administrator in universities can be specifically divided into four dimensions: information construction ability, information leading ability, information organization and coordination ability and information evaluation and promotion ability. In their research, Dai Ruihua and Zhang Lilian first included the concept of "collaboration" into the basic composition of information leadership of middle administrator in universities.

Lu Jianhong (2021, p.398) proposed on the basis of domestic and foreign research reviews that the information-based leadership of middle administrator in universities should include six sub-dimensions, including "basic information-based literacy and operational skills, information-based communication and coordination ability, information-based resource management ability, information-based environment construction ability, information-based planning, decision making and application improvement ability, and information-based personnel team building ability".

Yee (2000, p.259) selected 10 universities with relatively high level of education information development from the United States, the United Kingdom, Canada and other countries as research objects, and summarized the information technology leadership composition of middle administrator in universities noted in-depth analysis of the connotation of information leadership ability of middle administrator in these university.

Flanagan and Jacobsen (2003, p.393) proposed the information technology composition dimension of middle administrator in universities based on the information leadership promotion project of middle administrator in universities initiated by the Calgary City Board of Education. On the one hand, middle administrator in universities should play five roles. It is the manager of various information resources of the university, the defender of the rights and interests of teachers and students, the leader of organizing information learning, the practitioner of information technology application and the demonstrator of information construction in the community; On the other hand, middle administrator in universities should realize the five goals of effective integration of educational technology and teaching, namely, drawing a common vision, providing fair opportunities, organizing student participation, building networks and supporting teacher development. In this model, noted the closed-loop process of introduction, management and evaluation, combined with the effective integration of information technology and education and the application of five job responsibilities of middle administrator in universities, the goal of information leadership of middle administrator in universities can be achieved and the university reform can be promoted.

Xiao Yumin (2006, p.25) explained the technical leadership of middle administrator in universities from the four dimensions of technology decision-making, management, service and evaluation, and noted that in the educational and teaching environment of university information, the four dimensions of technology decision-making, technology service, technology management and technology evaluation were closely integrated and interlinked. The cognition, understanding and execution ability of middle administrator in universities to these four dimensions will be of great importance to learning university information construction and information application play a role in promoting and encouraging .

Wang lei (2015, p.33) adopted the idea of system theory to construct the system framework of university education information. In this system framework, the information-based leadership of middle administrator in universities is divided into four dimensions: information-based decision-making and planning ability, information

awareness and information technology ability, information-based organization and management ability, information-based evaluation and promotion ability.

Shi Zhongliang (2023. p.61) pointed out in his article "Difficulties and Breaknoteds in the Development of information-based Leadership of Middle administrator in primary university and Colleges under the Perspective of Education Modernization" that it is difficult to carry out the information-based construction of university without the strong leadership and support of middle administrator in universities, which means that middle administrator in universities play an important role in the information-based construction of university. And he defines the concept of information leadership of middle administrator in universities as the process in which middle administrator in universities drive teachers, students and employees to promote the development of information construction noted the category of information ability or information consciousness. Its dimensions mainly include five aspects: technology awareness and attitude, technology planning and evaluation, technology theory and specification, technology knowledge and skills, technology integration and application

Su Linmeng (2019, p.101) proposed that with the wide application of new technologies such as artificial intelligence and big data in the field of education, the connotation of information leadership of middle administrator in universities should also develop in the direction of intelligence, individuation and diversification. After summarizing and sorting out the existing information leadership structure model of middle administrator in universities, he pointed out that information vision planning ability, information resource construction ability, information campus management ability and information evaluation ability are the four essential elements of information leadership of middle administrator in universities. However, in the era of education information 2.0, the information leadership of middle administrator in universities has undergone new changes in the above four dimensions

Zhang Yan (2019, p.86) constructed the content structure of information-based leadership of middle administrator in universities from the two dimensions of work composition and information-based literacy of middle administrator in universities. The specific structure model is shown in Figure 2-6. According to the

model, it can be seen that the information literacy of middle administrator in universities includes four aspects: information consciousness, information knowledge, information ability and information ethics and morality. The information leadership work of middle administrator in universities includes five aspects: training of information talents, planning of information system, construction of information environment, information management and evaluation of information development

Lei Lihua (2021, p.21) et al. noted that the construction of education information in the era of education information 2.0 requires various concepts of education and specific requirements of the state and society to be reflected in all aspects of university information construction. Lei Lihua et al. comprehensively considered the development strategy and promotion route of education information at the macro level and the practice of university information at the micro level to build the information leadership structure model of middle administrator in universities in the era of education information 2.0.

**Table 2.1** Components Variables of information leadership

Name Variable	Information	Information vision	Teaching and	Information construction	Law and morality	Information-based	Information	Information skills	Leadership style and mood	Information literacy
Erhan Unal (2015)		√	√	√	√					
Wu da wei (2013)	√									
Zhang Yihua (2003)		√		√		√				
Du Yuan (2009)	√	√					√		√	
Hua Fang (2010)							√			√



Table 2.1 (Continue)

Name Variable	Information	Information vision	Teaching and	Information construction	Law and morality	Information-based	Information	Information skills	Leadership style and mood	Information literacy
Wang lei(2015)	√	√				√		√	√	
Sun Zhenxiang (2010)		√		√				√		√
Wu Haiyan (2011)	√	√				√				√
Zhao Leilei (2017)		√		√		√		√		
Dai Ruihua (2019)	√						√	√		√
Lu Jianhong (2021)		√				√		√	√	√
Yee(2000)		√		√		√	√			
Flanagan(2003)		√		√		√				√
Shi Zhongliang (2023)	√			√					√	
Su Linmeng (2019)	√			√			√	√		√
Zhang Yan (2019)	√		√						√	
Lei Lihua (2021)	√			√		√				√
Hua Fang (2010)		√		√						√
<b>Total</b>	<b>9</b>	<b>11</b>	<b>2</b>	<b>10</b>	<b>1</b>	<b>8</b>	<b>5</b>	<b>6</b>	<b>5</b>	<b>9</b>

In conclusion, the variables are sorted from highest to lowest frequency, they are information vision planning, information construction management and promotion, information organization and information team, information-based evaluation, information literacy, information skills and applied leadership, information environment construction, leadership style and mood, teaching and learning, law and morality. According to the above ranking and combined with the actual situation, the above variables are summarized as 1) information literacy, 2) information vision, 3) information construction and management, 4) information-based evaluation, and 5) organizational atmosphere.

### **1. Information Literacy**

Information literacy originated in the late 20th century, which emphasizes that individuals should have the ability to effectively use information technology to acquire, evaluate, create and disseminate information, and be able to understand the impact of information technology on social, economic and personal life.

Li Chaoping (2010, p.222) noted that in the age of 2.0, the rapid development of information technology promotes the change of social industrial structure, which causes the change of social demand for talents in higher education, and further promotes the innovation and development in the field of higher education. Therefore, the improvement of information literacy of middle administrator is the concrete embodiment of higher education conforming to the main theme of social development in the information age.

Liu Jinzhi (1985, p.667) pointed out that the improvement of information literacy is an important component to promote the professional development of university administrators, and the change of administrator' roles is an important basis for the improvement of information literacy. In the traditional teaching relationship of universities, teachers are the main source of college students' professional knowledge learning. In the Internet era, students have more diverse ways to search, acquire and choose resources, and administrator no longer have the absolute authority to control resources.

Wang Shuhua (2022, p.107) after the continuous follow-up investigation and research of 233 university administrators in Zhejiang it is found that more than 40% of the administrators in this region are low in the ability to convert data into information and information into university-running decisions, which is still far from the basic quality required to support administrator in running university. This shows that there is still much room for improvement in the ability and level of administrator to acquire data, process and analyze data. In conclusion, the information literacy refers to middle administrator in universities with high information literacy should have a certain degree of information awareness, master abundant information technology knowledge and skills, and be able to communicate effectively with teachers, students and stakeholders by means of information technology.

In conclusion, middle administrator in universities with high information literacy should have a certain degree of information awareness, master abundant information technology knowledge and skills, and be able to communicate effectively with teachers, students and stakeholders by means of information technology.

## **2. Information Vision**

Information vision originated in the 1990s, when the global information wave was rising. The information vision is not only about the technology itself, but more importantly about how the technology supports and drives the organization to achieve its long-term goals and mission.

James Kouzes (2014, p.245) noted that the top-level design of administrator in information development mainly involves two aspects: one is to establish a clear vision of information development; The second is to formulate specific short -, medium - and long-term information work plans and implementation plans according to the information vision. Moreover, in the process of formulating the vision plan for university information, administrators should comprehensively consider the basic situation of education reform and information technology development, and conduct research and review on the development of university information as a whole. Specifically, it requires the headmaster to put forward the overall goal of information construction in a targeted way based on the basic status quo, university-running conditions and university-running characteristics of the university, and formulate corresponding

implementation plans and promotion strategies on the basis of clarifying the key and difficult points of information construction of the university.

Feng Duo (2011, p.141) noted that Only with a feasible top-level design can a university truly realize the "grand blueprint". The famous Soviet educator Sukhomlinsky once said: "A good manager is a good university." The reason why educators noted that administrators play such an important role in the process of university construction and development is that the most constructive force in the university is the administrator, and the most destructive one is also the administrator. If the top level design of the university is scientific, stratified, in line with the law of education and in line with the actual needs of the university's own development, the university is likely to develop healthily and sustainable and even hope to achieve leapfrog development, otherwise the development of the university is very likely to be lukewarm or even misguided.

Qin Sheng (2021, p.8) noted that the As the advocate, leader and practitioner of university information construction, administrators' top-level design for the long-term development of university education information construction is an important engine to promote the rapid and sustainable development of university information. In 2014, the Ministry of Education issued the "Information Leadership Standards for Primary and Secondary university Administrators (Trial) " clearly pointed out that administrators, as the leaders of university information construction, should "organize the formulation of university information development plans and take them as an important part of the overall development plan of the university according to the requirements of the national education information policy and the actual situation of the university." Therefore, it can be made clear that as the leaders of university information construction, administrator' top-level design of university information construction is not only the obligatory duty of administrator, but also an important manifestation of their leadership.

In conclusion, the information vision refers to based on the basic premise of promoting the development of university education information, middle administrator of universities lead the majority of teachers and students to scientifically evaluate the future development trend of basic education information on the basis of in-depth

analysis of the current situation of university information construction, and according to the national strategic decision-making and the spirit of relevant documents, It makes a comprehensive and stratified plan for the construction of information infrastructure, the construction and allocation of information resources, the investment of information construction funds and the information management mechanism of the university.

### **3. Information Construct on and Management**

Information construction and management originated in the middle and late 20th century. With the commercial application and development of computer technology, organizations began to realize the importance of information technology for improving work efficiency, optimizing management processes and enhancing decision support.

Wang Li (2019, p.23) noted in the information construction of colleges and universities, there are problems such as the inability to effectively share information of various information systems, self-contained systems, and lack of overall planning. National education information has brought development opportunities to public colleges and universities, and information construction is a means for public colleges and universities to improve their educational level and management level and enhance their competitiveness. It also objectively analyzes the key points and main problems of information construction in public colleges and universities.

Liu Pengzhi (2017, p.343) proposed the ideas and system framework of information integration construction in colleges and universities, aiming at the problems such as the lack of effective information sharing and the lack of effective integration of application systems. noted strengthening the sense of responsibility to enhance the degree of attention to the construction of information resources, noted strengthening the sense of openness to seek strong support from brother university and society. The construction of university information resources has made great progress. In addition, noted the formulation of effective information rules and regulations, promote the university information management to develop in a benign direction. In university, teachers are both participants and beneficiaries of university

information construction. How to construct and manage the information resources of principals, teachers are the most vocal.

Wang Shuhua (2022, p.110) noted that the construction and management of information resources is the core work of university principals leading the information construction. In the process of investigation, he found that some principals have a wrong understanding of the construction of university information resources, and they do not invest enough in and pay enough attention to the construction of information resources. Some principals noted that information construction is hardware construction, and even simplify the university information construction to buy a few computers and projectors, which is all of the university information construction. He noted that the construction and management of university information resources is the focus and difficulty of university information construction, if this work is not deep and detailed, university information construction is like "water without a source, a tree without roots", it is difficult to implement. He put forward improvement measures to further improve the information construction of public colleges and universities: resource integration, development and perfection of software system, change of teaching staff concept and increase investment in information technology, and put forward the development trend of information technology construction: service-oriented and user-oriented.

In conclusion, the information construction and management is the core subject of university education information, which mainly includes university information resource construction, university information education and management, and university information culture construction. The construction of information resources is mainly embodied in the construction of information human resources, information teaching resources and information learning platform. Information-based teaching and management mainly involves principals leading teachers and students to carry out curriculum reform under the information technology environment, leading information technology and curriculum integration, leading to promote university information-based teaching, creating a good information-based teaching environment, and carrying out university daily management based on information technology. Information culture construction is an inevitable pursuit for university to promote

education information, which involves principals leading university to build university information culture atmosphere, leading information culture system guarantee and leading information ethics construction.

#### **4. Information-Based Evaluation**

Information-based evaluation in the late 20th century. With the development of a large number of government and enterprise information projects, people began to pay attention to the systematic and scientific evaluation of information achievements. In the early stage, we mainly focus on the completion of technical projects and the compliance of technical indicators.

Li Chaoping (2005, p.225) noted that university information construction is a stratified project, which involves a lot of work such as equipment introduction, platform construction, system construction and management dimension. When university information develops to a certain extent or a project is nearing the end, it is necessary to evaluate and accept the project construction, fund use efficiency and resource allocation. It can be said that the promotion of university information evaluation is not only an important link of information construction, but also an important embodiment of the principal's information leadership. If the headmaster has a good ability to promote information evaluation, he can lead the teachers and students to do a good job in the evaluation and feedback of information construction on a regular basis, and find out the problems in time. By summarizing the experience and lessons, he can ensure that the university information construction in the future will not go astray.

Sun Zhenxiang (2015, p.39) noted that based on the detailed information evaluation index, the evaluation of university information construction is made. noted the evaluation and analysis, the prominent problems and weak links of university information construction are found and lessons are summed up, which provides scientific and effective theoretical basis for further revising information construction planning and formulating targeted measures.

Wang Shuhua (2022, p.108) noted that The evaluation and promotion of university information is an important link in the information construction. Only by doing this link well can we ensure the healthy and sustainable development of

university information construction. He found that earlier attention to this work was not enough, or his ability to lead the implementation of information evaluation and promotion was not strong, resulting in university information construction investment, no output, construction, no acceptance, and information development was always lukewarm. He suggested that we should set up an information construction management team, formulate an evaluation index system, and carry out in-depth evaluation to make the university information construction more scientific and effective.

In conclusion, the information-based evaluation is an important link to maintain and promote the information of university education. Specifically, managers are pushing in the process of university information construction, the implementation of university information vision planning, teachers' application of information technology teaching ability level, university information technology and education and teaching integration degree, students' learning quality, students based on information technology learning ability, information environment construction, university information software and hardware resources construction and use, information the construction of the personnel team and the use of special funds for information construction shall be evaluated objectively, accurately and continuously objective analysis and diagnosis, and then effective adjustment.

### **5. Organizational Climate**

Organizational climate originated from the field of industrial psychology in the early 20th century, when scholars began to realize the important impact of informal organizational structure, interpersonal relationship and employee attitude on production efficiency in the work environment.

Kurt Lewin (1988, p.18) et al, based on Edward Tolman's motivation theory, defined organizational climate as the common perception of a single individual or the same or similar parts of the cognitive map in the minds of different individuals. This is the essence of organizational climate and constitutes the logical starting point for the study of organizational behavior on organizational climate. Since then, on the basis of Kurt Lewin, many scholars have made different interpretations on the connotation of organizational climate from different perspectives.



Kopelman (1990, p.47) studied the relationship between leadership style, organizational climate and organizational loyalty and found that organizational climate plays a mediating role between leadership style and organizational loyalty.

Argyris (1996, p.633) defined organizational climate as a relatively stable and continuous state of interaction within an organization among its members. Campbell (1970) noted that organizational atmosphere is a series of attributes formed by the interaction between people, organizations and the environment, which is generated by individuals' perception of their working environment. She argued that organizational atmosphere is a normal attribute of the organizational environment itself, which has similarities with the characteristics of the objective environment, and organization members can build an overall perception or subjective recognition of the organizational environment noted the commonalities of the two.

Litwin and Stringer (1968, p.306) proposed in their book *Motivation and Organizational Climate* that organizational climate can be studied and examined from the perspective of the overall organizational system, and that organizational climate is a series of direct or indirect self-perception generated by organizational members in their specific organizational situations. These perceptions can guide employees' values, beliefs and behavioral motivations, and thus have an impact on organizational performance. Tagiuri (1968, p.259) noted that organizational climate can directly affect the behavior of organization members based on their perception of the organizational environment. There would be a psychological state within an organization that could be perceived by organization members, and the differences in psychological states formed by each person would lead to different behavioral motivations and work performance of employees. James (1982) proposed that organizational climate is the common perception of organization members about working environment, mood influence and their own interests. James emphasizes the guiding effect of individual perception on individual behavior, and noted that when a certain degree of consistency among individual perceptions in an organizational group, they converge to the organizational level, which is usually referred to as the organizational atmosphere or team atmosphere.

Third, interpret from the perspective of the organization as a whole. Forehand and Gilmer (1964, p.34) regarded organizational climate as a set of variables to describe an organization, including the ability to distinguish the organization from other organizations, the relative time history, and the behavior of members within the organization. Wang Shuhua (2022, p.111) noted that organizational atmosphere, subordinates will actively self-regulate and constantly enhance their ability to prevent and resist unreasonable events, so make leaders the synergistic effect of generating positive emotions among subordinates and colleagues.

In conclusion, noted the analysis and interpretation of the concept of organizational climate from the above different research perspectives, it is not difficult to find that organizational climate is generated noted interaction and communication among organizational members. It is a kind of subjective perception of the organizational environment produced on the basis of the full cognition of organizational behavior such as organizational work philosophy, routine affairs, work flow and management system. This kind of perception can cause the difference of employees' behavior, and have different degrees of influence on the work performance of organization members. Therefore, a leader can fundamentally solve the problems and contradictions within the organization according to the impact of organizational atmosphere on organizational performance, and enhance the work efficiency and management performance by creating a good organizational atmosphere to enhance the enthusiasm of employees.

### **Contexts of Public Universities in Zhejiang**

The origins of public universities in Zhejiang can be traced back to the late Qing Dynasty and the early Republic of China, when China began to introduce western education systems and establish higher education institutions in the modern sense.

As China's largest economic province, Zhejiang's economic aggregate reached 8.26 trillion yuan in 2023, ranking fourth in the country. As the only province approved to build a common prosperity demonstration zone, the per capita GDP has reached more than 125,000 yuan, and the per capita disposable income has reached more than 63,000 yuan, ranking third in the country and first in the province, more than 24,000

yuan higher than the national average. But Zhejiang ranks only 11th out of 31 provinces in the number of universities and has not added a new one in five years amid a frenzy of university building.

In 2024, there will be 109 universities in Zhejiang, including 62 undergraduate colleges, 36 public ordinary undergraduate colleges, 3 public vocational colleges, 5 private ordinary undergraduate colleges, 15 independent colleges that have not yet completed their conversion, 2 Chinese-foreign cooperative undergraduate colleges and 1 private vocational college. There are 47 colleges and universities, 37 public vocational colleges and 10 private vocational colleges.

Compared with the total number, the number of public undergraduate colleges in Zhejiang increased from 33 five years ago to 39. After the conversion of Zhejiang University's Twin Star to public undergraduate, three independent colleges, namely, Qiuzhen College of Huzhou Normal University, Oujiang College of Wenzhou University and Nanhu College of Jiaxing University, have also been converted to public ordinary undergraduate. Zhejiang Ocean University Donghai College of Science and Technology and Zhejiang Medical College merged to form the province's first public vocational college, this year Jinhua Vocational College and Zhejiang Mechanical and Electrical vocational College also joined hands to upgrade to public undergraduate vocational college. Public undergraduate education is the highest quality resource in the field of higher education. To build a public undergraduate college involves resource investment and integration in all aspects. Although the number of colleges and universities in Zhejiang has not increased, the increase in the number of public undergraduate colleges and universities can better illustrate the powerful and effective resource investment. In addition to the increase in quantity, the quality of public universities in Zhejiang has also been continuously improved, with Zhejiang University of Technology, Hangzhou Dianzi University and Zhejiang Normal University ranking among the national top 100. But generally speaking, it still relies on Zhejiang University to support the status of the country, and there is a big fault in the province's universities. The number of public colleges and universities in Zhejiang is not large, and the number of 37 public colleges and universities is far less than that of the neighboring provinces of Anhui and Jiangxi, whose economic aggregate and population

size are far smaller than their own. However, Zhejiang has a total of 15 national double-high plan to build higher vocational colleges, of which two national Double-high plan high-level schools A grade has been upgraded to vocational undergraduate this year. The quality of public specialized colleges is in the forefront of the country.

Kong Fan (2023, p.55) research found Zhejiang is located in the south of China's Yangtze River Delta, the land area of only 101, 800 square kilometers, accounting for 1.06% of China, is one of the smallests in China. However, Zhejiang's economic and social development indicators have always been at the forefront of China. Since the reform and opening up, the economic growth rate of Zhejiang has maintained an average annual growth rate of 12.7%, about 3 percentage points higher than the average level of China (9.8%). In 2022, the regional GDP of Zhejiang is RMB7, 771.5 billion, ranking fourth in China (the top three are Guangdong, Jiangsu and Shandong), which is equivalent to the total GDP of Saudi Arabia and other countries in that year. With 65.4 million permanent residents, the per capita GDP of Zhejiang is 118, 830 yuan, which has reached the level of upper middle-income countries. In summary, Zhejiang people, who account for about 4% of China's population, have created 7% of China's national wealth on 1% of China's land, creating the "Zhejiang phenomenon" that has attracted worldwide attention (Zhejiang Provincial People's Government Announcement, 2022).

Qiu Junping (2022, p.76) found which largely lags behind the economic strength of the Zhejiang is known as the "state of culture" reputation, basic education in China is leading, but the development of public universities has been lagging behind for a long time. According to the data of the China Center for Scientific Evaluation and Research (RCCSE), there are 77 public universities in Zhejiang in 2022, including 36 undergraduate universities and 41 junior colleges, ranking ninth in China in terms of competitive strength, At the same time, the number of universities in Zhejiang is relatively small among the top tens and cities in the regional competitiveness of China's public universities. Zhejiang ranks 10th in educational resources and 9th in teaching level in China. The scale and quality of the development of universities are extremely incompatible with the fourth and fifth places in the ranking of economic development indicators.

Shi Zhongliang (2023, p.69) noted the lag of public universities not only restricts the development of education in Zhejiang, but also becomes the "bottleneck" for the to achieve the goal of modernization. Therefore, since the reform and opening up, Zhejiang Provincial Party Committee and provincial government have insisted on putting education in a strategic position of priority development. In 1992, the strategy of revitalizing the noted science and education was established; in 2002, the 11th Provincial Party Congress put forward the strategic goal of building a strong education; in 2006, the Outline of building a strong Education was formulated; and in 2020, the Outline of Medium and Long-term Education Reform and Development Plan of Zhejiang (2020-2030) was formulated. In 2021, the "14th Five-Year Plan for the Development of Public Universities of Zhejiang (2021-2025)" and "International Development Plan for Public Universities of Zhejiang (2020-2030) " were formulated. (Zhejiang Provincial Department of Education, 2023)

In conclusion, after several years, the overall level and quality of public universities in Zhejiang have been greatly improved, but there is still a big gap between the comprehensive strength of public universities in the region, and it is not coordinated and adapted to the economic development of the and the people's demand for high-quality public universities. Under such circumstances, building a strong of information higher education and striving to realize information of public universities should become a strategic task of education development in Zhejiang and an urgent requirement to serve the economic and social development of the.

## **Related Research**

International scholars have also conducted in-depth research on information leadership in the aspects of technology leadership, information development, technology management, and capability innovation.

Ronald Anderson and Sara Dexter (2005, p.347) noted that university information leadership is the ability of college middle-level administrators and technical coordinators to make goals, make budget decisions and implement policies. There are proposed that the leadership of university education information leaders includes the ability to provide scientific and technological support, assist teachers and

students to make better use of science and technology, develop information methods, and use hardware and software on the ground. R.Burk (2012, p.50) noted that information-based leadership mainly integrates information technology and management to promote people's ability to quickly absorb and utilize information technology.

Huvila (2014, p.544) noted that information-based leadership refers to the process of using modern information technology to optimize and improve individual or organizational work flow, methods and performance. Norris (1996) explained the connotation of university information-based leadership from the perspective of technology leaders promoting the application of information technology in universities. He noted that information-based leadership should include enhancing stakeholders' understanding of information technology and promoting the integration of academic system and administrative system. In the application of information technology as a leader, guide, consultant, as well as as the designer of information technology infrastructure, and stressed the vital role of information technology training.

Aten (1996, p.104) emphasizes the ultimate goal of technology leadership and defines educational information leadership as: leaders predict the future development trend of science and technology noted personal interpersonal relationship and effective integration of information technology and other knowledge to support effective teaching practice, so as to achieve educational goals. The leadership of education information means that both college middle-level administrators and university management personnel can demonstrate and support the application of information technology in teaching, lead the innovation of teaching and culture, and apply information technology to improve the effectiveness of teaching environment.

P Christie (2001, p.12) et al. emphasized environment and relationship, pointing out that information-based leadership is "the complex interaction of individuals, institutions or organizations in social, political and economic contexts". Ameson Jameson (2013, p.18) argued that information leadership exists at every level, from education policy makers to middle-level administrators, associate middle-level administrators or ceos, from top administrator to middle administrator, junior

administrator, teachers, career advisors, student support staff and student representatives. Burke (2001) proposed that information leadership is the ability to integrate information technology and management, so as to promote people's rapid absorption and utilization of information technology. Annunzio and Liesse (2001, p.37) noted that information leadership helps senior administrator of enterprises to reorganize their enterprises and participate in the rapidly developing information technology competition, which means changing the culture and cultivating a fast and flexible management attitude to face the internal changes of new technologies and new economies.

Pulley (2002, p.19) points out that information-based leadership is "hyperlinked", that is, the focus of information-based leadership is no longer the leading role of individual leaders, but gradually shifted to groups and organizations. Based on the perspective of information management, Huvila (2014, p.560) defined information-based leadership as "the ability to lead the information process activities in an organization and make clear decisions about the use, application and management of information resources and information equipment". Avolio (2014, p.79) argues that information technology leadership is a kind of Advance dinformation Technology intervention, promote the organization of the individual, group, and even the organization itself, The influence process of changes in thinking mode, working attitude, emotional affiliation, behavioral content and work performance.

Karahanna and Watson (2006, p.427) noted that information-based leadership refers to the chief information officer or top executive of an organization's information system who promotes the implementation and realization of the organization's team strategy by setting the leadership direction, creating action commitments, and mobilizing the organization in terms of system, policy and psychology. And adjust the information system module to adapt to the changing environment, so that it can increase the value of the information system module, so as to achieve the common goals of the organization. From the perspective of the constituent elements of competence, scholars have described information-based leadership in detail. At the same time, an important dimension of information-based leadership is intelligence. David Preston (2007) pointed out that information system strategy must support

organizational business strategy, and proposed that leaders (especially CIO) must have the ability to make information system strategic decisions.

Shamir (1999, p.509) noted that the powerful information acquisition capability provided by information Technology not only changes the knowledge structure of leaders, but also changes the nature of leadership. Glick (2014, p.889) noted the development of information technology and its impact on society, concluded that information leadership shows a growing trend. Avolio (2014, p.141) summarized the theories, researches and practices of information-based leadership in the past 20 years, and explained in detail the dynamic mechanism of emerging information technology's impact on leadership, how leadership can successfully cope with emerging information technology, and the impact of emerging information technology on organizations.

Wassenaar (2011, p.97) proposes that technology has become and will continue to be a fundamental support for the development of shared leadership. Cordery (2009, p.58) ,the key component of the development and sustainability of shared leadership in virtual teams is the support structure, including both social structure and technical structure, which enables members to communicate more easily and convey information smoothly in different times and regions. These support mechanisms may consist of existing technical infrastructure that supports communication between group members or others, and may include training in such skills that can enhance the group. From the perspective of applied research, gave projects and activities for enterprises to improve information leadership skills in specific practical cases.

R.Burk (2012, p.347) analyzed how information-based leadership plays a role in the management and preservation of these records noted successful cases of electronic record management in Malaysian enterprises. In fact, information Technology provides a brand new practice environment for leadership. In the process of interaction with leadership, the connotation, structure and effect of leadership have all changed, and in the process of interaction, The role, application and effect of information Technology itself have also changed, and information leadership is formed in this two-way interaction process. By studying the influence of information



Technology on leadership as a technology tool, it will be helpful to further explore the formation mechanism and growth mechanism of information-based leadership.

Bruce J Avolio (2000, p.388) highlights the significant impact of abrupt environmental changes, arguing that unusual and extreme practices, often referred to as trigger events, are critical to the development of Transformation Leadership. Karahanna and Watson (2006,p.427) noted that information leadership is the role of an organization's chief information officer or top information system executive in promoting the implementation of the organization's strategy by setting direction, creating commitment, mobilizing institutional, policy and psychological resources and other resources. And adjust the information system module to adapt to the changing environment, so that it can increase the value of the information system module, so as to achieve the common goals of the organization.

Penny-Plain (2020, p.1) denies technological determinism, arguing that technology alone is only one of the success factors, and technology alone cannot make virtual team work effective. It is more important to choose and use technologies that meet people's communication preferences to support people to work smoothly together. Don't just train people on how to use new remote technologies, as many organizations do, and forget about how to work together effectively in a remote environment. Organizational culture and the way employees behave have a greater impact on the success of virtual team work than which particular tool is chosen.

Clow (2013, p.683) found that learning analysis technology can be used by middle-level administrators and other administrator to extract the social network characteristics of teachers more conveniently, so as to classify different learner types for decision-making intervention. From the perspective of technology leaders promoting the application of information technology in universities.

Norris and Dolence (1996, p.18) stressed that stakeholders should enhance their understanding of information technology, promote the integration of academic system and administrative system, act as the navigator, guide, consultant, etc, in the application of information technology, and act as the designer of information technology infrastructure. The vital role of information technology training was emphasized.

John C Maxwell (2017, p.91) noted that leadership is top-down. But if the top leaders are all powerful, without any assistance from the middle leaders, then the top leaders can not effectively lead, in other words, good middle leaders can increase the value of the boss. In the field of information leadership in universities, compared with senior leaders such as middle-level administrators, middle-level administrators, as middle-level leaders, are closer to teachers and students of have a better understanding of the working conditions, problems and needs faced by teachers and students and employees, and their influence on teachers and students and employees is often greater than that of senior leaders. If universities lack excellent middle-level administrators as the leaders of college information construction, then the middle-level administrators of universities are forced to be responsible for every teacher, staff and everything, which is unimaginable and unrealistic. If excellent middle-level administrators use their influence and investment to help college middle-level administrators solve these problems, it will expand the scope of information influence of college middle-level administrators.

Jameson Jil (2013, p.530) noted that educational leadership exists at all levels, from educational policy makers to middle-level administrators, associate middle-level administrators or ceos of universities, from top administrator to middle administrator, grassroots administrator, teachers, student support staff and student representatives. It also influences and shapes the learning process and outcomes of students in some important ways.

Pulley and Sessa (2002, p.77) noted that information technology and its resulting information process have formed a new leadership practice environment, created a new leadership group and a new leadership model. information technology and its network environment have significantly changed the leadership situation, leadership skills and leadership connotation.

Theo Haris (2018, p.75) concluded noted the experiment that if we focus on race, class, gender, disability, sexual orientation and other historically marginalized factors, we can create a more equitable and just environment for university, which is conducive to promoting the practice of university information leadership. International researchers have studied the degree of self-perception of college middle-level

administrators' information leadership and the impact of individual differences on their ability.

Erhan Unal (2015, p.277) investigated the perceived level of leadership self-efficacy of 320 university administrators. To test whether there are significant differences in their information leadership level in university level, professional qualifications and participation in on-the-job training programs. Positive emotion leadership and strategic resource leadership are also indispensable factors of university information leadership, and these two functions are related to the information leadership of the university senior and middle levels. Other studies noted that positive emotional guidance is supportive culture, including humane consideration, encouragement, recognition and care. Managing and providing resources is a very important aspect of information leadership.

The International Society for Technology in Education (ISTE) proposed a structural model of information-based leadership in education management, which includes: Leadership and Vision, Learning and Teaching, Protection, Management and Operation, Social, Legal and Moral Issues. National College for university Leadership (NCSL) points out that information leadership mainly includes three aspects: vision, application and evaluation; Among them, "vision" includes that leaders should have the skills and knowledge needed to carry out planning, and let all members understand the importance of planning; "Application" includes how to innovate educational information, how to integrate information technology into the process of teaching and learning, and how to continuously and effectively apply information technology to improve the quality of life of students and teachers. "Evaluation" includes the review of resources, the evaluation of construction and the supervision of application.

John C Maxwell (2017, p.100) proposed the "five-layer leadership" model for middle-level leaders, arguing that leadership is a dynamic process. In order to obtain such power, middle-level leaders must establish relationships with everyone they meet, and their position on the "leadership step" depends on the nature and degree of relationship with certain people. And they all start at the bottom of five steps or five levels. The first level is position influence. middle leaders' existing positions or

titles give them some power, but if they only influence others noted their positions, rather than making efforts to increase their own influence, then people can only be forced to obey, and only obey the orders within their authority. The second level is to exert influence beyond the position, build trust with subordinates, respect them, attach importance to their value, not only care about whether subordinates complete their work, but also care about themselves; It is because they care that they will trust you more, recognize your leadership, and be willing to follow your leadership. Third, because of the contribution of the middle level leaders to the team, team members will be more dependent on the middle level leaders as leaders to guide the direction of progress. At the fourth level, talent development, middle leaders must devote their energy to their subordinates, become their mentors, respect and guide them, create new value for them and make them more important.

Hunt (2004, p.3) noted that we now have a huge theoretical system of leadership, which covers various theoretical perspectives, such as trait theory, information processing theory, systematism, complexity, etc, and spans different levels of analysis, such as macro, meso and micro levels. At the same time, it integrates the theoretical ideas of many other neighboring disciplines, such as sociology, psychology, economics, political science and so on. But the reason why leadership research is complicated is that we lack a unified concept or theory of leadership. Therefore, it is the future trend of international research on information leadership to construct the multi-analysis framework of information leadership of university middle-level administrators.

The International Society for Technology in Education (ISTE) has developed information leadership for education management in NETS A-2009. The National College for university Leadership (NCSL) also provides an evaluation index system for information-based leadership. However, the evaluation criteria of college middle-level administrators' information-based leadership are still not clear and consistent, and with the expansion of online education and the deepening of technology integration, the research on standards and policies of university information-based leadership, including middle-level administrators information-based leadership, will be paid more and more attention. In the process of coping with the challenges and changes of

university education information, we must constantly formulate and adjust the corresponding policy standards to ensure the effectiveness and sustainability of administrators information leadership from the institutional level. In this context, how to innovate and perfect the standards of middle-level administrators information-based leadership will become the prerequisite for the sustainable development of middle-level administrators information-based leadership theory and practice.

Karahanna (2006, p.427) noted that, The understanding of leadership, including information-based leadership, is still not comprehensive enough. There is a lack of internal connection among various theories and a unified concept or theory of leadership, which makes it impossible for us to understand them as a whole. Therefore, if the research of information leadership of college middle-level administrators cannot be mixed together to form a complete pattern, then the theoretical system of information leadership is still disorganized. Therefore, according to the group characteristics of middle-level administrators, the roles and responsibilities of middle-level administrators' information-based leadership, and the relationship between middle-level administrators' information-based leadership and other stakeholders, it is very urgent and necessary to construct the theoretical basis and analytical framework of college middle-level administrators' information-based leadership.

Kenny (1983, p.501) noted that leadership itself is not a stable and normalized characteristic. On the contrary, leadership will change, and individual perceivers will adjust their perceptions to make them as consistent as possible with other perceivers in the group, environment or even larger social context (such as an organization). Therefore, to pay attention to the social situation of information leadership of college middle-level administrators, it is necessary to focus on the analysis of academic tension and administrative tension faced by college middle-level administrators in information leadership, various relationships inside and outside the college that need to be handled, and personalized college technology culture that needs to be constructed. At the same time, we should pay attention to the individual and personalized characteristics and needs of college middle-level administrators' information leadership. International scholars are increasingly aware that it is almost unrealistic to pursue a universal leadership model, and it does not necessarily conform

to the reality of information leadership, because leaders do not develop in the same way, or follow the same growth model. According to the characteristics of leaders themselves and the specific context of leadership development, an individual information-based leadership development growth track is proposed and established, such as group-based development model and mixed growth model, which are the actual needs of college middle-level administrators' information-based leadership.

Ren C M (2013, p.53) analyzed the role of university middle-level administrators in administrative affairs and summarized them into the following aspects: 1) The person in charge of undergraduate teaching in a college needs to coordinate university-level functional departments and supervise the design of undergraduate teaching programs, teaching arrangements for teachers, and internship programs for graduates. 2) Discipline development builders, in order to better promote discipline construction and development, enhance exchanges and cooperation with brother universities and peers, participate in the discussion and exchange meeting of discipline professional construction. 3) The admissions officer of the college needs to coordinate and coordinate the specific work of undergraduate postgraduate education, postgraduate and doctoral enrollment quota arrangement, and postgraduate preliminary examination, adjustment and re-examination; Coordinate the enrollment quota and enrollment scale of multi-unit joint enrollment. 4) The defenders of the academic community and the development interests of the college, on the one hand, need to expand the communication channels with teachers from other university, and maintain or increase the interactive relationship with leaders and teachers in the university; On the other hand, it is necessary to coordinate a number of cooperative affairs headed by the functional departments at the university level. 5) The "gatekeeper" of the college's recruitment of new teachers and the annual performance evaluator of teachers need to participate in the college's personnel recruitment, adjustment and other affairs. It can be seen that in terms of administrative affairs, the roles of college middle-level administrators are diversified, including structural division of roles, such as undergraduate teaching, subject majors, integration of science and education, etc, and hierarchical role playing, such as coordinating functional

departments, communicating with other universities, and organizing teaching and research within the college.

Duan Xinxing (2018, p.438) and other scholars summarized the academic roles of university middle-level administrators, such as: 1) As a preacher and teacher, they need to perform the duties of doctoral and master's students' supervisors, and spend academic energy and time guiding and cultivating graduate students. 2) As the project leader, it is necessary to set up a project team according to different stages of the project, implement the project, coordinate and supervise the project progress; Led the completion of the project, condensed the research results, and applied for academic awards. 3) Academic "leaders" who need to attend professional conferences related to their own research fields in China and abroad to improve their own professional academic quality; At the same time, he expands his professional influence in academia by publishing academic papers, co-writing books and translating international works. 4) Thesis reviewer, as the academic degree Center of the Ministry of Education and the thesis review expert of partner institutions, responsible for reviewing the doctoral and master's defense papers within the discipline research direction and spot checking the degree papers of graduated students. This is only a comment on the study of the academic role of the middle-level administrators, in fact, the academic role of the middle-level administrators is much more than the above mentioned. Based on China's research results and practice, the academic role of university middle-level administrators involves not only imparts knowledge and classroom teaching, but also carries out scientific research and tracks the cutting-edge development of knowledge in disciplines.

Liu Hui (2017, p.52) analyzed the role of middle-level administrators in the management system of the university, and noted that they were responsible for the communication and cooperation between the university's top and grass-roots levels as well as functional departments at the same level. They were the link of internal communication in the university organization and had the responsibility to ensure the smooth conduct of various affairs in the university. The information leadership of the middle-level team is to participate in the information decision-making under the guidance of the senior management of the university, assist the senior management in

planning the information development vision and promote the realization of the vision, which is embodied in: Participate in the formulation and implementation of relevant strategies, coordinate the communication between high-level and grass-roots groups, build and manage university information resources, provide a good support platform for the application of teaching and learning information for teachers and students, and provide advanced management systems for the work of other business departments.

Wang Yingjie (2015, p.118) noted that in the process of information-based leadership, due to the influence of the management system of higher education, especially the resource allocation system, and the idea of official orientation, the power to make resource allocation rules is usually in the hands of functional departments, and these rare resources are usually the lifeblood of colleges as university-running entities. In order to maintain an advantage (or at least not suffer losses) in the allocation of resources, the middle-level administrators must go all out and take the initiative to deal with the relationship with the functional departments. In addition, for the middle-level administrators, there are many "black swan events" caused by role anxiety caused by emergencies or uncertainties, which requires the middle-level administrators to face challenges and strengthen its information leadership.

Wang Jinghong (2016, p.120) summarized and analyzed the views outside China on the role of the middle-level administrators, and noted that the middle-level administrators occupies the middle position in the organizational structure of the university, is the center of disputes, conflicts and arguments, is the "peacemaker" between different factions, the leader who controls internal and external threats, and the communicator who guides and encourages the life and work of the faculty and staff of the university. They act as coordinators, negotiators, and facilitators, and must navigate between a range of stakeholders, whether individual or group. Pu Xuetao (2002) put forward 10 kinds of roles of Chinese department heads, explored the reasons why middle-level administrators (i.e, department heads) are prone to role conflicts, and put forward suggestions to avoid conflicts. Theoretical exploration of information leadership of college middle-level administrators. By analyzing, learning from and transplantation of international leadership theories and middle-level



administrators' role theories, Chinese scholars attempt to provide a theoretical basis for the practice of university middle-level administrators' information-based leadership, and at the same time, explore and form a localized theoretical system of university middle-level administrators' information-based leadership based on Chinese university information-based leadership practices and cultural traditions.

Wang lei (2015, p.133) analyzed and sorted out various university of international leadership theories, and noted that trait theory, behavior theory, contingency theory and new leadership theory in international leadership theories were more stratified and mature. In terms of research methods, more quantitative research methods are used, and more data measurement techniques are relied on, focusing on the transformation from a single experience description to a multidisciplinary comprehensive perspective and method. Most of the research focuses on the role, function, leadership, ability and quality of the middle-level administrators (department head) , and the results are fruitful. However, due to the significant differences between national conditions and culture, development stage of higher education, university governance mode, the power and responsibility orientation, quality and ability requirements of middle-level administrators (department chairs) and the actual development situation of China's higher education, not all research conclusions can provide a reasonable and appropriate explanation for the information leadership of middle-level administrators in Chinese universities. In contrast, the research results of the middle-level administrators or department head in the world show the problem orientation, the diversity of perspectives, the breadth and depth of the research, and the scientific research methods, which give this research a very rich reference and inspiration. At the same time, these studies reflect that universities attach importance to the status of middle-level academic administrator, invest in training, and support scholars in the research of middle-level administrators or department heads, which is worthy of learning and reference for Chinese education management departments and university leaders.

Wang Yue (2015, p.53) noted that the leadership of middle-level administrators is mainly manifested in three levels: task leadership, relationship leadership and spiritual leadership. Based on his own middle-level administrators

experience and noted a large number of interviews and case analysis, The author constructs the "Six forces model" of middle-level administrators leadership, which includes six dimensions: strategic leadership, change leadership, learning leadership, communication leadership, moral leadership and cultural leadership. The research results of show that the leadership of middle-level administrators of secondary colleges mainly lies in non-power influence, and its core factors are ranked as moral level, profound knowledge and affinity.

Jin Zhanzhong (2014, p.18) studied the charisma of middle-level administrators of secondary colleges, and noted that charisma is "an internal attraction composed of personal belief, accomplishment, knowledge, wisdom, ability, etc, which is the core factor for leaders to successfully achieve leadership", that is, the core component of "leadership", and combined with the organizational characteristics of universities, he built the charisma model of middle-level administrators. It is suggested that we should use reason, ability, virtue, emotion and planning to enhance the charisma of the middle-level administrators of the secondary college.

Ren Chuming (2009, p.28) made an in-depth study of the role and task of the middle-level administrators and proposed that the college is not only a part of discipline construction but also a part of university management, which combines the two into one. The two dimensional intersectionality of the organizational structure of the college makes its organizational members come from both the sub-system and the sub-system of the discipline, including teachers, students and researchers from the sub-system of the discipline, as well as administrative personnel, teaching support personnel and logistics service personnel from the sub-system of the department. This kind of organization is composed of professionals and administrative personnel, and its operation is usually regulated and affected by professional value norms and bureaucratic rules and regulations. As the head of the college, the middle-level administrators is also given the dual role of the sub-system of the section and the sub-system of the discipline because of this intersection, and becomes a member with different values, work content, work requirements and operation mode. As a middle-level administrators, he is not only different from the pure administrative staff, but also different from the complete professional teacher. He is a typical cross-border

worker who must be affected by the two subsystems at the same time, and his role play is restricted by the professional value norms and the bureaucratic rules and regulations. The convergence of the two seed systems at the point of the college exerts control and influence on the middle-level administrators at the same time, which requires the middle-level administrators to strike a balance between the two in order to promote the development of the discipline and the development of the college, and to achieve the overall goals of the university. The role behavior of the middle-level administrators usually takes into account the dual requirements from the discipline norms and the administrative rules and regulations, and fully considers the two different modes of operation and their respective characteristics.

Sun Zhenxiang (2014, p.2) noted that the middle management team plays a role in connecting the previous and the next in the university, and is responsible for the communication between the senior management, the grassroots and various departments in the university. It is also a link for the internal communication of the university and can ensure the smooth progress of various affairs in the university. The role of middle-level team information leadership is to jointly participate in information decision-making under the guidance of college middle-level administrators, assist college middle-level administrators in planning information development vision and promote the realization of this vision. The practice and development of university information leadership should adhere to the concept of distributed leadership, and the university information leadership should change from the traditional centralized and top-down structure of college middle-level administrators to the distributed leadership composed of college middle-level administrators, middle-level leaders and teachers. Therefore, the composition of university information leadership should also be composed of these three levels of leadership, namely, the information leadership of college middle-level administrators, the information leadership of middle-level teams and the information leadership of teachers.

Liu Hui (2017, p.63) noted that middle-level administrators information leadership can be reflected from two dimensions: vertical and horizontal. Among them, the vertical dimension mainly reflects the information leadership of individuals, while the horizontal dimension mainly reflects the information leadership of groups.

In the vertical dimension, leadership at different levels is distributed within the university itself, and individual leaders are in charge of the level or organization under their jurisdiction. For example, senior leaders such as middle-level administrators and vice middle-level administrators of universities are in charge of the "education information leading Group" of high-level organizations. In the horizontal dimension, the same level of leadership is reflected in universities and between universities and social groups, such as the MOOC alliance of industry or local universities that has emerged in recent years, as well as the MOOC alliance of Chinese universities in Computer Education, UOOC (Excellent Course) Alliance, East-West Alliance MOOC courses, etc, all of which are led by a certain university or some universities. This is group leadership in the horizontal dimension. Of course, group leadership also exists in the vertical dimension. For example, college middle-level administrators or middle-level administrators need to lead and coordinate mid-level functional departments in universities. Individual leadership also exists in horizontal organizations, for example, the charisma of MOOC teachers attracts and influences teachers in the university or other university, but the role and representation of leadership in these two cases are generally relatively weak.

Feng Duo (2011, p.145) emphasized the important value and role of social capital in the information leadership of college middle-level administrators. He noted that among universities, middle-level administrators best understand the students' situation, teachers' strength, resource supply, curriculum allocation, academic dynamics, as well as society's demands and expectations for academics and students of the college. They are in a "structural hole" position in the information construction of the college and have the space and ability to exert both administrative power and academic power. There is a broader network of participation, norms of reciprocity, and social trust, known as social capital. She also emphasized the role of field, arguing that the way of thinking of field theory, which focuses on power capital, relationship interaction and capital competition, is still very relevant and inspiring to understand the political power and administrative power of Chinese university departments, and embed the two into economic capital, social capital, cultural capital and symbolic capital. The relationship between the two can be better explained and resolved.

Therefore, the contradiction and conflict between academic power and administrative power of university departments originate from the game and competition of various capitals. They noted that the theory of "field" can provide a new perspective of "relationship" for the study of the governance structure of university departments and the practice of middle-level administrators' information leadership.

In conclusion, Chinese scholars attach great importance to the information-based leadership of university administrators based on the demands of China's political and economic development for higher education and the rapid development of information process, and analyze it from university middle-level administrators, middle administrator, teachers and other groups. And the related cultural tradition, social relations, resource acquisition and other influencing factors or external environment are studied and analyzed, and relatively rich research results are obtained.

## Chapter 3

### Research Methodology

This research focuses on model for improving the information leadership of middle-level administrators in public universities in Zhejiang. To study the current situation and provide model and evaluation for improving the information leadership of middle-level administrators in public universities in Zhejiang. The reasercher have the following procedures.

Phase 1: To study the current situation of information leadership of middle-level administrators in public universities in Zhejiang.

Phase 2: To develop model for improving information leadership of middle-level administrators in public universities in Zhejiang.

Phase 3: To evaluate the adaptability and feasibility of model for improving information leadership of middle-level administrators in public universities in Zhejiang.

#### **Phase 1: To study the current situation of information leadership of middle-level administrators in public universities in Zhejiang.**

##### **1. The population / sample group**

The population of this research were 440 middle-level administrators from 5 public universities in Zhejiang.

According to Krejcie and Morgan (1970) sampling table, the sample group of this research were 205 middle-level administrators from universities in Zhejiang. By using stratified random sampling and simple random sampling was also used by drawing from public universities.

**Table 3.1** Components university and sample size

No	Public university in Zhejiang	Orientation	Population	Sample group
1	Zhejiang Agriculture and Forestry University	North	110	47
2	Zhejiang Ocean University	East	88	41
3	Zhejiang Normal University	Central	73	34
4	Wenzhou University	South	78	36
5	Lishui University	West	101	47
<b>Total</b>			<b>440</b>	<b>205</b>

According to table 3.1, it showed that The 5 universities are distributed in the north, east, west, south and central of Zhejiang, including key undergraduate universities, general undergraduate specialized universities. They are: Zhejiang Agriculture and Forestry University, Ocean University, Normal University, Wenzhou University, Lishui University.

## 2. Research instruments

### Questionnaire

The instrument to collect the data for objective one, to study the current situation of information leadership of middle-level administrators in public universities in Zhejiang was questionnaire. The questionnaire designed based on information leadership in five following aspects: 1) information literacy, 2) information vision, 3) information construction and management, 4) information-based evaluation, and 5) organizational atmosphere. the questionnaire was provided into two parts:

Part 1: Survey about personal information of respondents, classified by gender, age, years of service, professional background and educational level.

Part 2: Survey about the current situation of information leadership of middle-level administrators in public universities in Zhejiang. There are questions for information literacy, information vision, information construction and management,

information-based evaluation and organizational atmosphere. The criteria for data interpretation based on five-point Likert's scale, as follows:

5 express the level of information leadership of middle-level administrators at highest level

4 express the level of information leadership of middle-level administrators at high level

3 express the level of information leadership of middle-level administrators at medium level

2 express the level of information leadership of middle-level administrators at low level

1 express the level of information leadership of middle-level administrators at lowest level

### **Constructing a questionnaire process**

The construction process of questionnaire was as follows:

Step 1: Reviewing and analyzing documents, concepts, theories, and research related to information leadership of middle-level administrators.

Step 2: Constructing the questionnaire about the current situation of information leadership of middle-level administrators in public universities in Zhejiang. Then sending the questionnaire outline of questionnaire to the thesis advisors to review and revise the contents according to the suggestions.

Step 3: The index of objective congruence (IOC) of the questionnaire was examined by five experts was 1.00.

Step 4: Revise the questionnaire based on the experts' suggestions.

Step 5: The questionnaire was distributed to 30 middle-level administrators in public universities in Zhejiang for try-out. The reliability of the questionnaire was obtained by cronbach's alpha coefficient was 0.986.

Step 6: The questionnaire was applied to 205 middle-level administrators in public universities in Zhejiang.



### **3. Data collection**

The data collection for objective 1: To study the current situation of information leadership of middle-level administrators in public universities in Zhejiang, as following procedured:

Step 1: The researcher requested requirement letter form the graduate university, Bansomdejchaopraya Rajabhat University for requiring to collect the data from 205 middle-level administrators from public universities in Zhejiang

Step 2: The researcher distributed the questionnaire to 205 middle-level administrators.

### **4. Data analysis**

The data analysis in this research, the researcher analyze the data by package program, as follows:

Step 1: The personal information of the respondents was analyzed by university, gender, age, education level, professional title and years of middle-level administrators.

Step 2: The current situation of information leadership of middle-level administrators in public universities in Zhejiang in five following aspects: 1) information literacy, 2) information vision, 3) information construction and management, 4) information-based evaluation and 5) organizational climate was analyzed by Mean and standard deviation.

## **Phase 2: To develop model for improving information leadership of middle-level administrators in public universities in Zhejiang.**

### **1. key Informant**

The interviewees in this research were 10 high-level administrators in public universities in Zhejiang. The qualifications of interviewees are as follows: 1) high-level administrators of public universities in Zhejiang; 2) the regional distribution of universities should be more reasonable and balanced; 3) the tenure of the high-level administrators shall not be less than 3 years, and the distribution of the high-level administrators personal information such as gender, age, professional background and tenure shall be reasonable.

## 2. Research instruments

### Structured interview

The instrument to collect the data for objective two, to develop model for improving information leadership of middle-level administrators in public universities in Zhejiang.

#### Constructing a structured interview process

Step 1: Determine the topic of the interview and categorize the questions. The semi-structured interview questions are designed according to the information leadership theory of relevant college middle-level administrators and the results of questionnaire survey. The first part is to understand the respondents' views on the five variables that affect the information leadership of college middle-level administrators. The second part is the respondents' feelings on the information leadership of university middle-level administrators, their opinions on the information leadership of university middle-level administrators and their opinions on improving the information leadership of university middle-level administrators in Zhejiang.

Step 2: Formulate interview questions.

The first part of the interview questions, mainly from design in the following 5 aspects: 1) information literacy, 2) information vision, 3) information construction and management, 4) information-based evaluation, 5) organizational climate.

The second part of the interview questions is mainly to listen to the opinions and suggestions of the interviewees on improving the information leadership of college middle-level administrators in Zhejiang.

Step 1: Sort out the order of questions. Arrange the order of questions according to the logic and coherence of the interview. Gradually move from general issues to more specific ones.

Step 2: Modify structured interview questions based on expert advice.

Step 5: Form an interview table. Check whether the interview form has other questions that need to be added, determine the interview questions, and make the interview form.

### **3. Data collection**

The data collection for objective 2: To provide model for improving information leadership of middle-level administrators in public universities in Zhejiang.

Step 1: Prior to the interview, appointments were made with the interviewees in advance, and the permission of the subjects was obtained for the collection of materials. The interviews were conducted in training classrooms, conference rooms and offices, and participants were invited to review and verify the research results.

Step 2: In the process of data collection, structured interview method, open questionnaire survey and other means were used to collect answers related to information leadership of college middle-level administrators.

Step 3: After the interview, the main ideas should be separated noted constant review and repeated revision of the interview questions and collected data, so as to minimize the impact of self-bias on the survey results and ensure the accuracy and authenticity of the original materials.

Step 4: In this study, interview data were recorded by recording and writing to increase the reliability of the original materials.

### **4. Data analysis**

The structured interview about model for improving the information leadership of middle-level administrators in public universities in Zhejiang was analyzed by content analysis.

**Phase 3: To evaluate the adaptability and feasibility of model for improving information leadership of middle-level administrators in public universities in Zhejiang.**

#### **1. key Informant**

The experts for evaluation of the adaptability and feasibility of model for improving the information leadership of middle-level administrators were 9 high-level administrators in public universities in Zhejiang. The qualifications of the experts are as follows: 1) at least 5 years of work experience in high-level administrator in public

universities, 2) have extensive experience in information leadership, 3) graduated with doctor's degree, 4) academic title is associate professor or above.

## **2. Research instruments**

### **Evaluation form**

The instrument to collect the data for objective three, to evaluate the adaptability and feasibility of model for improving information leadership of middle-level administrators in public universities in Zhejiang.

### **Constructing a evaluation form process**

Step 1: Determine the problems of evaluation: Make clear that the content of evaluation is the information leadership of college middle-level administrators.

Step 2: Determine the members of the expert group: According to the content of the evaluation, invite 9 middle-level administrators in relevant fields to participate in the evaluation.

Step 3: Develop an evaluation plan: Develop an evaluation plan, including determining the evaluation method, content, requirements and schedule.

Step 4: Expert evaluation and review: After the evaluation program is determined, experts conduct independent evaluation and review. They can read and analyze the relevant literature, as well as discuss and communicate with each other to reach a consensus on the problem or program.

Step 5: Summarize and analyze expert opinions: Summarize and analyze the opinions of experts and formulate evaluation conclusions. For the issues with different opinions, it is necessary to conduct in-depth discussion and discussion, and finally form a comprehensive conclusion.

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

- 4.50 – 5.00 express highest level
- 3.50 – 4.49 express high level
- 2.50 – 3.49 express medium level
- 1.50 – 2.49 express low level
- 1.00 – 1.49 express lowest level

### **3. Data collection**

The data collection for objective 3: To evaluate the adaptability and feasibility of model for improving information leadership of middle-level administrators in public universities in Zhejiang.

Step 1: Organize a panel of experts to conduct discussion and interview to evaluate the accuracy, appropriateness and relevance of the questionnaire items, and finally divide the items into four categories: 1) those directly related to the topic; 2) indirectly related to the topic; 3) related to the topic, but not important or already included in other articles; 4) irrelevant to the subject.

Step 2: According to the purpose of the study, the expert then processes the entries, retains the category 1 entries, reviews the category 2 entries, and deletes the categories 3 and 4 entries.

Step 3: Organize and summarize the items again, put similar items together as far as possible, and keep the form of questions consistent as far as possible.

Step 4: After expert evaluation, the content validity of the questionnaire was calculated.

Step 5: Modify the questionnaire according to the discussion records of the expert group.

### **4. Data analysis**

The evaluation of the adaptability and feasibility of model for improving the information leadership of middle-level administrators in public universities in Zhejiang was analyzed by Mean and standard deviation.

## Chapter 4

### Data Analysis Results

This research was to study model for improving information leadership of middle-level administrators in public universities in Zhejiang. The data analysis result can be presented as follows:

1. Symbol and Abbreviations
2. Presentation of Data Analysis

The details are as follows.

#### Symbol and Abbreviations

- N : population
- n : sample group
- $\bar{X}$  : refers to mean value
- S.D.: refers to standard deviation

#### Presentation of Data Analysis

**Part 1: Personal information of middle-level administrators involved in the information leadership, divided into university, gender, age, education level, professional title, years of middle-level administrators.**

This section presents the analysis results of the personal information of respondents, divided into university, gender, age, education level, professional title, years of middle-level administrators. The data is presented in the form of frequency and percentage.

Table 4.1 Frequency and Percentage

(n=205)

	Personal Information	Frequency	Percentage
Gender	Male	122	59.51
	Female	83	40.49
	<b>Total</b>	<b>205</b>	<b>100</b>
Age	31-35 years old	10	4.88
	36-40 years old	46	22.44
	41-45 years old	67	32.68
	46-50 years old	57	27.80
	51 years old and older	25	12.20
	<b>Total</b>	<b>205</b>	<b>100</b>
Education level	Bachelor degree or below	40	19.51
	Postgraduate	156	76.10
	Doctoral candidate	9	4.39
	<b>Total</b>	<b>205</b>	<b>100</b>
Professional title	The lecturer or Assistant Professor	112	54.64
	Associate professor	77	37.56
	Professor	16	7.80
	<b>Total</b>	<b>205</b>	<b>100</b>
Years of middle-level administrators	<=5 years	57	27.80
	6years -10 years	84	40.00
	11 years-15 years	40	19.51
	16years -20 years	24	11.71
	More than 20 years	2	0.98
	<b>Total</b>	<b>205</b>	<b>100</b>

According to Table 4.1, it can be found that the respondents were distributed in the east, south, west, north and middle of Zhejiang, and the number of respondents was relatively uniform.

From the gender of the respondents, the number of male respondents was 112, accounting for 59.51%; There are 83 female respondents, accounting for 40.49%. The number of male respondents is slightly higher than the number of female respondents, indicating that the number of male middle administrators in Zhejiang is higher than that of female.

According to the age of the respondents, 0 people aged 30 and below, accounting for 0%, have the smallest number; 67 people aged 41 to 45, accounting for 32.68%, were the largest number. It shows that the age distribution of middle administrators in Zhejiang is mostly over 40 years old, and the age structure is too large.

According to the education level of the respondents, there are 156 postgraduate students, accounting for 76.10%, which is the largest number. There are 9 doctoral students, accounting for 4.39%. It shows that most of the middle administrators in Zhejiang are Administrators 's students, and the level of education is relatively high.

According to the titles of the respondents, there were 0 assistant titles, accounting for 0%, and the number was the least. There are 112 lecturers, the largest number. It can be seen that most of the middle administrators in Zhejiang have titles above the intermediate level, indicating that the title is taken as an important condition for the selection of middle administrators in Zhejiang.

According to the working years of middle administrators of the respondents, 84 people with 6-10 years, accounting for 40.98%, have the largest number; Two people over 20 years, accounting for 0.98%, the smallest number. It shows that middle administrators in Zhejiang are working less time in middle management positions.

## **Part 2: Current situation of information leadership of middle-level administrators in public universities in Zhejiang**

In this section, we present the analysis results of the of middle-level administrators in public universities in Zhejiang. The data is presented in the form of Mean and standard deviation.



**Table 4.2** The Mean and standard deviation of information leadership of middle-level administrators in public universities in Zhejiang in five aspects

(n=205)

No	Information leadership public universities in Zhejiang	$\bar{X}$	S.D.	Level	Order
1	Information literacy	3.77	1.22	high	2
2	Information vision	3.79	1.21	high	1
3	Information construction and management	3.75	1.24	high	4
4	Information-based evaluation	3.73	1.23	high	5
5	Organizational atmosphere	3.77	1.20	high	3
<b>Total</b>		<b>3.76</b>	<b>1.22</b>	<b>high</b>	

According to Table 4.2, the information leadership public universities in high level ( $\bar{X}=3.76$ ). Considering the result of this research aspects ranging from the highest to lowest mean were as follows: the highest level information vision ( $\bar{X}=3.79$ ), followed by information literacy ( $\bar{X}=3.77$ ), Organizational atmosphere ( $\bar{X}=3.77$ ), information construction and management ( $\bar{X}=3.75$ ), information-based evaluation is the lowest mean ( $\bar{X}=3.73$ ).

**Table 4.3** The Mean and standard deviation of information leadership of middle-level administrators in public universities in Zhejiang in information literacy.

(n=205)

No	Information literacy	$\bar{X}$	S.D.	Level	Order
1	Middle-level administrators have the concept of lifelong learning and development	3.80	1.18	high	4
2	Middle-level administrators have a strong sense of information responsibility	4.09	1.02	high	1
3	Middle-level administrators have a strong level of information technology	3.69	1.22	high	10
4	Middle-level administrators have strong technical application ability	3.72	1.24	high	8

Table 4.3 (Continue)

(n=205)

No	Information literacy	$\bar{X}$	S.D.	Level	Order
5	Middle-level administrators understand the ethics related to information technology	3.84	1.14	high	3
6	Middle-level administrators understand the laws and regulations related to information technology	3.63	1.29	high	11
7	Middle-level administrators consciously learn knowledge related to education information	3.73	1.28	high	6
8	Middle-level administrators skillfully use information technology to obtain network resources.	3.71	1.19	high	9
9	Middle-level administrators recognize the latest development trend of educational information	3.85	1.18	high	2
10	Middle-level administrators learn education information policies in a timely and effective manner	3.73	1.26	high	7
11	Middle-level administrators have the drive to tackle difficulties head-on	3.80	1.20	high	5
12	Middle-level administrators be more interested in emerging information technology	3.61	1.35	high	12
<b>Total</b>		<b>3.77</b>	<b>1.22</b>	<b>high</b>	

According to Table 4.3, the information literacy of middle administrators in public universities in high level ( $\bar{X}=3.77$ ). Considering the result of this research aspects ranging from the highest to lowest mean were as follows: the highest mean middle-level administrators have a strong sense of information responsibility ( $\bar{X}=4.09$ ), followed by middle-level administrators recognize the latest development trend of

educational information ( $\bar{x}=3.85$ ) , middle-level administrators understand the ethics related to information technology ( $\bar{x}=3.84$ ) , middle-level administrators have the concept of lifelong learning and development ( $\bar{x}=3.80$ ) , middle-level administrators be more interested in emerging information technology is the lowest mean ( $\bar{x}=3.61$ ) .

**Table 4.4** The Mean and standard deviation of information leadership of middle-level administrators in public universities in Zhejiang information vision.

(n=205)

No	Information Vision	$\bar{x}$	S.D.	Level	Order
1	Middle-level administrators help the principal establish an information vision that is recognized by all members of the university	3.73	1.23	high	7
2	Middle-level administrators often organize information vision exchange activities	3.85	1.20	high	2
3	Middle-level administrators actively promote new information technology to the university and promote reform during the formulation of vision planning	3.72	1.23	high	9
4	Middle-level administrators make information vision decisions	3.82	1.16	high	4
5	Middle-level administrators lead the formulation of the department's long-range, medium and near-term information vision planning	4.03	1.08	high	1
6	Middle-level administrators lead the formulation of the vision of the university information management system	3.70	1.19	high	10
7	Middle-level administrators lead the formulation of the vision for the construction of university information infrastructure	3.78	1.22	high	5
8	Middle-level administrators to lead the formulation of university information fund use planning vision	3.75	1.23	high	6

Table 4.4 (Continue)

(n=205)

No	Information Vision	$\bar{x}$	S.D.	Level	Order
9	Middle-level administrators interpret the university information vision plan to teachers and students on different occasions	3.73	1.32	high	8
10	Middle-level administrators combine talent training planning, information technology application planning and other planning with policies and regulations in information construction	3.84	1.18	high	3
11	Middle-level administrators make timely adjustments to information vision planning in the process of information construction	3.70	1.24	high	11
<b>Total</b>		<b>3.79</b>	<b>1.21</b>	<b>high</b>	

According to Table 4.4, the information vision of middle administrators in public universities in high level ( $\bar{x}=3.79$ ). Considering the result of this research aspects ranging from the highest to lowest mean were as follows: the highest mean middle-level administrators lead the formulation of the department's long-range, medium and near-term information vision planning ( $\bar{x}=4.03$ ), followed by middle-level administrators often organize information vision exchange activities ( $\bar{x}=3.85$ ), middle-level administrators combine talent training planning, information technology application planning and other planning with policies and regulations in information construction ( $\bar{x}=3.84$ ), middle-level administrators make information vision decisions ( $\bar{x}=3.82$ ), middle-level administrators make timely adjustments to information vision planning in the process of information construction is the lowest mean ( $\bar{x}=3.70$ ).

**Table 4.5** The Mean and standard deviation of information leadership of middle-level administrators in public universities in Zhejiang in information construction and management

(n=205)

No	Information construction and management	$\bar{x}$	S.D.	Level	Order
1	Middle-level administrators working of the information infrastructure is relatively perfect	3.73	1.18	high	9
2	Middle-level administrators to provide quality information resources to the whole university is their responsibility	3.67	1.37	high	12
3	Middle-level administrators working of the university has special departments and personnel to manage the university information work is conducive to improving the university information level	3.77	1.16	high	4
4	Middle-level administrators lead the construction of university information-based teaching resources	3.64	1.37	high	13
5.	Middle-level administrators actively participate in the construction of information resource platform for teachers' teaching application	3.70	1.27	high	10
6	Middle-level administrators have taken the initiative to participate in higher-level university information construction planning	3.76	1.24	high	5
7	Middle-level administrators provide support for information construction in terms of system and fund planning	3.74	1.23	high	8
8	Middle-level administrators build a mechanism to improve the information level of teachers and students	3.76	1.28	high	5

Table 4.5 (Continue)

(n=205)

No	Information construction and management	$\bar{x}$	S.D.	Level	Order
9	Middle-level administrators actively promote teachers to implement information-based classroom teaching	3.74	1.15	high	7
10.	Middle-level administrators support the use of information management methods in personnel, finance and asset management of the university	3.83	1.13	high	3
11	Middle-level administrators provide rich information teaching resources for teachers and students to download and use	3.67	1.34	high	11
12	Middle-level administrators reasonably allocate funds, human resources and teaching resources to ensure the completion and continuous implementation of information construction planning	3.92	1.20	high	1
13	Middle-level administrators effectively implement, manage, supervise and plan the work content related to information technology	3.85	1.17	high	2
<b>Total</b>		<b>3.75</b>	<b>1.24</b>	<b>high</b>	

According to Table 4.5, the information construction and management of middle administrators in public universities in high level ( $\bar{x}=3.75$ ). Considering the result of this research aspects ranging from the highest to lowest mean were as follows: the highest mean middle-level administrators reasonably allocate funds, human resources and teaching resources to ensure the completion and continuous implementation of information construction planning ( $\bar{x}=3.92$ ), followed by middle-level administrators effectively implement, manage, supervise and plan the work

content related to information technology ( $\bar{x}=3.85$ ) , middle-level administrators support the use of information management methods in personnel, finance and asset management of the university ( $\bar{x}=3.83$ ) , middle-level administrators working of the university has special departments and personnel to manage the university information work is conducive to improving the university information level ( $\bar{x}=3.77$ ) , middle-level administrators lead the construction of university information-based teaching resources is the lowest mean ( $\bar{x}=3.64$ ).

**Table 4.6** The Mean and standard deviation of information leadership of middle-level administrators in public universities in Zhejiang in information-based evaluation.

(n=205)

No	Information-based evaluation	$\bar{x}$	S.D.	Level	Order
1	Middle-level administrators develop a clear information resource evaluation system	3.75	1.25	high	7
2	Middle-level administrators often use information methods for management or evaluation	3.82	1.23	high	2
3	Middle-level administrators consider information technology ability as a factor for human resource management	3.79	1.20	high	3
4	Middle-level administrators Administrators y of information technology is an important factor in evaluating educational reform	3.74	1.18	high	8
5	Middle-level administrators regularly organize the evaluation of the university's information vision planning and implementation	3.89	1.19	high	1
6	Middle-level administrators regularly organize the assessment of the information teaching	3.71	1.24	high	9
7	Middle-level administrators regularly organize the assessment of the construction of information resources in the university	3.60	1.20	high	11

Table 4.6 (Continue)

(n=205)					
No	Information-based evaluation	$\bar{x}$	S.D.	Level	Order
8	Middle-level administrators regularly organize the assessment of the use of university information funds	3.78	1.17	high	4
9	Middle-level administrators clearly identify the current development status of university education information	3.57	1.39	high	12
10	Middle-level administrators evaluate the university's information-based teaching environment	3.64	1.35	high	10
11	Middle-level administrators supervise the implementation of the university information plan	3.76	1.17	high	5
12	Middle-level administrators put forward corresponding suggestions on the improvement of information planning according to the implementation of the plan	3.76	1.18	high	6
<b>Total</b>		<b>3.73</b>	<b>1.23</b>	<b>high</b>	

According to Table 4.6, the information-based evaluation of middle administrators in public universities in high level ( $\bar{x}=3.73$ ). Considering the result of this research aspects ranging from the highest to lowest mean were as follows: the highest mean middle-level administrators regularly organize the evaluation of the university's information vision planning and implementation ( $\bar{x}=3.89$ ), followed by Middle-level administrators often use information methods for management or evaluation ( $\bar{x}=3.82$ ), middle-level administrators consider information technology ability as a factor for human resource management ( $\bar{x}=3.79$ ), middle-level administrators regularly organize the assessment of the use of university information funds ( $\bar{x}=3.78$ ), middle-level administrators clearly identify the current development status of university education information is the lowest mean ( $\bar{x}=3.57$ ).



**Table 4.7** The Mean and standard deviation of information leadership of middle-level administrators in public universities in Zhejiang in organizational atmosphere.

(n=205)

No	Organizational atmosphere	$\bar{x}$	S.D.	Level	Order
1	Middle-level administrators help the principal to set up the university information management team and ensure the orderly progress of the university information construction and planning	3.61	1.30	high	12
2	Middle-level administrators guide all members of the university to create a good information campus culture	3.69	1.25	high	11
3	Middle-level administrators implement the people-oriented management concept everywhere	3.91	1.04	high	2
4	Middle-level administrators maintain a friendly atmosphere between people	3.85	1.18	high	3
5	Middle-level administrators support each other and help subordinates	4.04	1.07	high	1
6	Middle-level administrators share their experience and skills with their subordinates	3.76	1.17	high	7
7	Middle-level administrators encourage their subordinates to speak out different ideas	3.72	1.23	high	10
8	Middle-level administrators implement the people-oriented management concept everywhere	3.74	1.23	high	8
9	Middle-level administrators implement the people-oriented management concept everywhere	3.79	1.21	high	4

Table 4.7 (Continue)

(n=205)

No	Organizational atmosphere	$\bar{x}$	S.D.	Level	Order
10	Middle-level administrators implement the people-oriented management concept everywhere	3.75	1.18	high	6
11	Middle-level administrators implement the people-oriented management concept everywhere	3.77	1.19	high	5
12	Middle-level administrators implement the people-oriented management concept everywhere	3.60	1.36	high	13
13	Middle-level administrators implement the people-oriented management concept everywhere	3.74	1.13	high	9
<b>Total</b>		<b>3.77</b>	<b>1.20</b>	<b>high</b>	

According to Table 4.7, the organizational atmosphere of middle administrators in public universities in high level ( $\bar{x}=3.77$ ). Considering the result of this research aspects ranging from the highest to lowest mean were as follows: the highest mean middle-level administrators support each other and help subordinates ( $\bar{x}=4.04$ ), followed by middle-level administrators implement the people-oriented management concept everywhere ( $\bar{x}=3.91$ ), middle-level administrators maintain a friendly atmosphere between people ( $\bar{x}=3.85$ ), middle-level administrators implement the people-oriented management concept everywhere ( $\bar{x}=3.79$ ), middle-level administrators implement the people-oriented management concept everywhere is the lowest mean ( $\bar{x}=3.60$ ).

### **Part 3: Implementation and analysis results of optimization model for improving information leadership of middle-level administrators in public universities in Zhejiang.**

This section presents the analysis results of the interview contents about the model for improving information leadership of middle-level administrators in public universities in Zhejiang

The interviewees in this research were 10 high-level administrators in public universities in Zhejiang. The qualifications of interviewees are as follows: 1) high-level administrators of public universities in Zhejiang; 2) the regional distribution of universities and universities should be more reasonable and balanced; 3) the tenure of the high-level administrators shall not be less than 3 years, and the distribution of the high-level administrators individual characteristics such as gender, age, professional background and tenure shall be reasonable. The list of interviewees is as follows:

1. How to enhance the sense of information responsibility? In addition, do you have any suggestions for the information literacy of public universities?

2. How should middle management leaders develop the department's long-range, medium and near-term information vision planning? In addition, do you have any suggestions for the information vision?

3. How should middle administrators rationally allocate funds, human resources and teaching resources to ensure the completion and continuous implementation of information construction planning? In addition, do you have any suggestions for the information construction and management?

4. How can middle administrators organize regular evaluations of the university's information vision planning and implementation? In addition, do you have any suggestions for the information-based evaluation?

5. How do middle administrators support and help their subordinates? In addition, do you have any suggestions for the organizational atmosphere?

The structured interview designed based on the current situation of information leadership of middle-level administrators in public universities in Zhejiang in five following aspects: 1) Information literacy, 2) Information vision, 3) Information

construction and management, 4) Information-based evaluation, 5) Organizational atmosphere. Five questions from the interview are as follows:

**Table 4.8** Personal information of interviewee

(N=10)

Interviewee	Education background	Interview Date	Interview Time
Interviewee 1	<b>Education:</b> Administrators 's degree <b>Professional title:</b> Professor <b>High-level administrators work experience:</b> 4 years	March 3 <sup>st</sup> , 2024	10: 00 am GMT+8 30 minutes
Interviewee 2	<b>Education:</b> Administrators 's degree <b>Professional title:</b> Associate professor <b>High-level administrators work experience:</b> 5 years	March 10 <sup>st</sup> , 2024	11: 00 am GMT+8 32 minutes
Interviewee 3	<b>Education:</b> Administrators 's degree <b>Professional title:</b> Lecturer <b>High-level administrators work experience:</b> 10 years	March 10 <sup>st</sup> , 2024	9: 00 am GMT+8 28 minutes
Interviewee 4	<b>Education:</b> Doctor's degree <b>Professional title:</b> Professor <b>High-level administrators work experience:</b> 7 years	March 13 <sup>st</sup> , 2024	10: 00 am GMT+8 37 minutes
Interviewee 5	<b>Education:</b> Administrators 's degree <b>Professional title:</b> Lecturer <b>High-level administrators work experience:</b> 6 years	March 13 <sup>st</sup> , 2024	9: 00 am GMT+8 30 minutes

Table 4.8 (Continue)

(N=10)

Interviewee	Education background	Interview Date	Interview Time
Interviewee 6	<b>Education:</b> Administrators 's degree <b>Professional title:</b> Associate professor <b>High-level administrators work experience:</b> 7 years	February 27 <sup>st</sup> , 2024	10: 00 am GMT+8 32 minutes
Interviewee 7	<b>Education:</b> Administrators 's degree <b>Professional title:</b> Associate professor <b>High-level administrators work experience:</b> 5 years	February 27 <sup>st</sup> , 2024	10: 00 am GMT+8 36 minutes
Interviewee 8	<b>Education:</b> Administrators 's degree <b>Professional title:</b> Associate professor <b>High-level administrators work experience:</b> 4 years	March 3 <sup>st</sup> , 2024	11: 00 am GMT+8 30minutes
Interviewee 9	<b>Education:</b> Administrators 's degree <b>Professional title:</b> Lecturer <b>High-level administrators work experience:</b> 9 years	March 10 <sup>st</sup> , 2024	3: 00 pm GMT+8 31 minutes
Interviewee10	<b>Education:</b> Doctor's degree <b>Professional title:</b> Professor <b>High-level administrators work experience:</b> 12 years	March 10 <sup>st</sup> , 2024	4: 00 pm GMT+8 30 minutes

According to table 4.8, it showed that the personal information of 10 interviewees, education background, Years of high-level administrators, Professional title, interview date, and interview time.

noted conversations with 10 Interviewees, combined with literature review and questionnaire data, the researcher propose the following model for improving.

**Table 4.9** Model for improving information leadership of middle-level administrators in public universities in Zhejiang

Factor	Guidelines for improving information leadership of middle-level administrators	
Improving information literacy	1	Enhance information awareness, cultivate sensitivity to information and value judgment, take the initiative to pay attention to current events, industry trends and professional knowledge, and form a cognitive habit of the importance of information.
	2	Administrators information skills, learn and Administrators basic computer operations, including but not limited to operating systems, office software (such as Word, Excel) , Internet search skills and the installation and use of commonly used application software.
	3	Improve information retrieval ability, Administrators advanced skills in using library resources, databases and Internet search engines, and be able to quickly and accurately locate required information resources.
	4	Information processing and analysis, developing the ability of information classification, screening, verification and integration, using statistical software, data analysis tools and programming languages to improve the efficiency of data processing and information analysis.
	5	Strengthen information security and privacy protection, enhance the understanding of network security threats, learn how to protect personal information, including setting strong passwords, identifying phishing and other fraud, and comply with relevant laws and regulations.

Table 4.9 (Continue)

Content	No	Guidelines for improving information leadership of middle-level administrators
	6	Cultivate information ethics and social responsibility, establish correct information ethics, respect copyright, protect the privacy of others, do not spread false information, and actively participate in building a healthy information environment.
Promoting information vision	1	Formulate information development strategy, clarify the long-term goal of information development of universities, and provide clear direction and long-term, medium and short-term information vision planning for all teachers and students.
	2	Strengthen the construction of information infrastructure, improve the construction level of campus network, data center, cloud computing and other infrastructure, and provide stable and efficient technical support for information applications.
	3	Promote information-based teaching, utilize information technology means, innovate teaching methods, improve teaching effects, and meet students' personalized learning needs.
	4	Build a digital campus, promote the digitization of campus management, service, office and other aspects, and improve the efficiency of campus management and service quality.
	5	Strengthen information security guarantee, establish and improve information security management system, improve teachers and students' awareness of information security, and prevent network attacks and data leaks.
	6	Strengthen the training of information talents, and improve the information literacy and application ability of teachers and students by offering relevant courses and training.

Table 4.9 (Continue)

Content	No	Guidelines for improving information leadership of middle-level administrators
	7	Strengthen international exchanges and cooperation in information , and improve the international level of information construction in universities by participating in international academic conferences and introducing foreign advanced technologies.
Enhancing information construction and management	1	Establish unified information technology standards and platforms, and formulate a set of unified information technology standards and protocols for the whole university to ensure the compatibility and interoperability between various systems.
	2	Strengthen infrastructure construction, invest in upgrading network infrastructure, including high-speed network, wireless coverage, data center, etc, to provide stable and fast network access environment for teachers and students.
	3	Promote the construction of smart teaching environment, and promote the use of smart classrooms, online learning platforms, virtual laboratories and other modern teaching tools.
	4	Promote the improvement of teachers' information technology ability, regularly organize teachers to participate in information technology application training, and help teachers effectively integrate into information-based teaching practice.
	5	Implement data-driven decision support and use big data analysis technology to collect and analyze data from teaching, scientific research, management and other aspects to provide scientific basis for university decision making.



Table 4.9 (Continue)

Content	No	Guidelines for improving information leadership of middle-level administrators
	6	Promote industry-university-research cooperation and technological innovation, introduce the latest scientific and technological achievements into teaching and management practice, and encourage teachers and students to participate in innovative projects to cultivate future information talents.
	7	Rationally allocate capital, human resources and teaching resources to ensure the completion and continuous implementation of information construction planning.
Enhancing information-based evaluation	1	To clarify the evaluation objectives and index system, it is necessary to establish clear and specific evaluation objectives according to the goals of university information construction.
	2	Implement regular evaluation and dynamic monitoring, establish a regular information work evaluation mechanism, and use big data and intelligent analysis tools for real-time monitoring, timely detection of problems and adjustment of strategies.
	3	Take teachers and students as important participants in information evaluation, and collect their feedback on information service use experience and satisfaction.
	4	Introduce third-party evaluation agencies for in-depth evaluation to obtain more objective and professional opinions and suggestions.
	5	Strengthen the application and continuous improvement of results, and closely link the evaluation results with resource allocation, performance appraisal and development planning.
	6	Strengthen the training of information evaluation, improve the application ability of information evaluation technology, and ensure the effective use of evaluation tools and resources.

Table 4.9 (Continue)

Content	No	Guidelines for improving information leadership of middle-level administrators
Improving organizational atmosphere	1	Demonstration and guidance by senior leaders. College leaders should personally participate in and actively promote information construction, and demonstrate their importance and support for information noted their own learning and practice.
	2	Strengthen the awareness of information and cultural construction, raise the awareness of information of all staff and students and integrate information into campus culture by holding special lectures, seminars, training and other activities on information.
	3	Establish a cross-departmental collaboration mechanism. Information construction involves teaching, scientific research, management and other aspects, so it is necessary to break departmental barriers and establish a cross-departmental communication and collaboration platform.
	4.	Encourage innovation and tolerance of failure, create a safe trial-and-error environment, encourage faculty and staff to try new technologies and new methods, even if they encounter failure, they can learn from it and constantly optimize.
	5	Provide necessary resources and support for subordinates, ensure sufficient capital, technology and human resources to invest in information construction, help them overcome technical obstacles and improve their information technology application ability.
	6	Implement information feedback and improvement mechanism, establish effective information feedback channels, so that teachers and students can put forward opinions and suggestions on information services.

According to table 4.9, the researcher proposed the model for improving information leadership of middle-level administrators in public universities in Zhejiang in five aspects, which contain 32 measures. There are 6 measures for improving information literacy, 7 measures for promoting information vision, 7 measures for enhancing information construction and management, 6 measures for enhancing information-based evaluation, 6 measures for improving organizational atmosphere. The framework of the model is as follows:



**Figure 4.1** Model for improving information leadership of middle-level administrators in public universities in Zhejiang

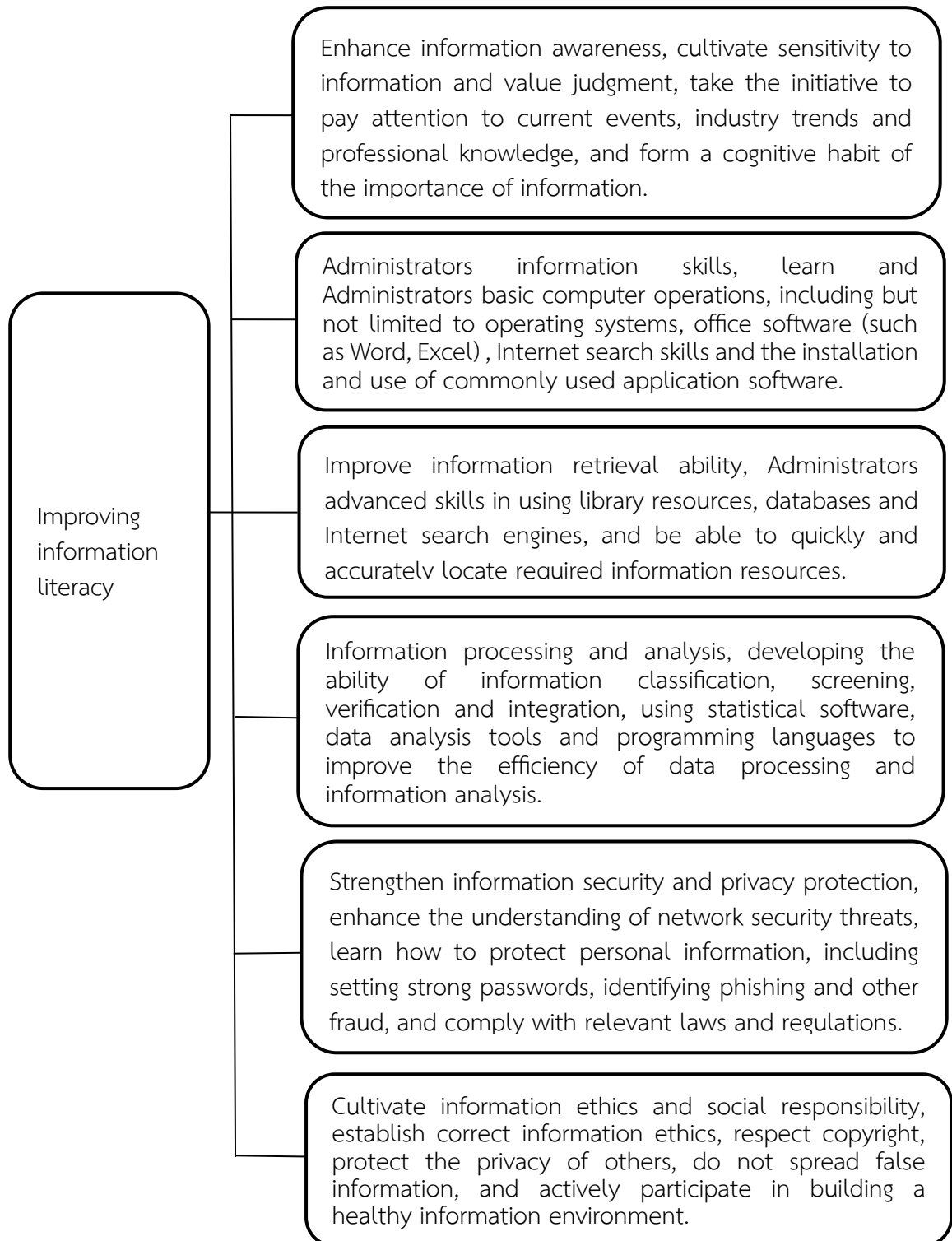


Figure 4.2 Model for improving information literacy

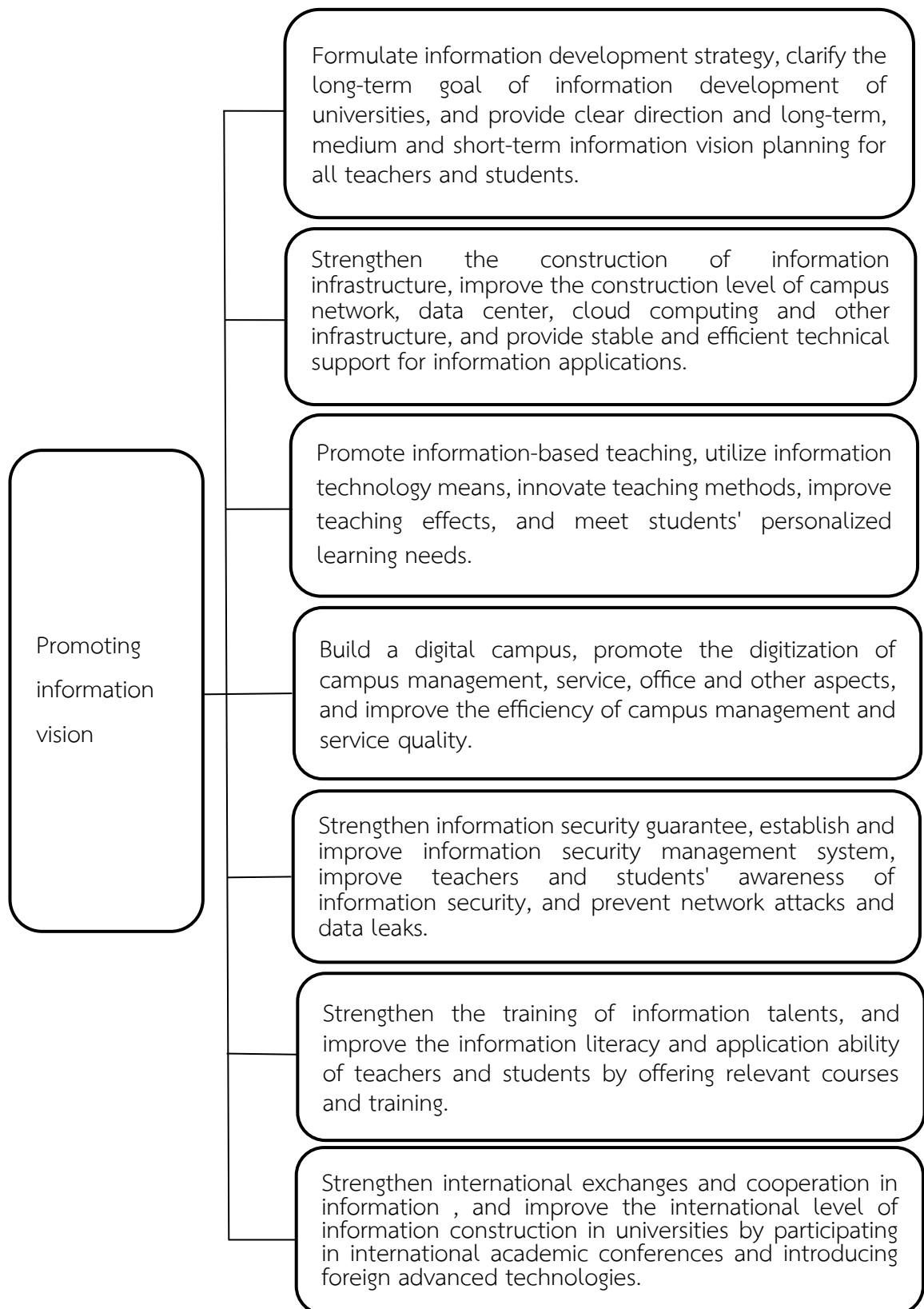
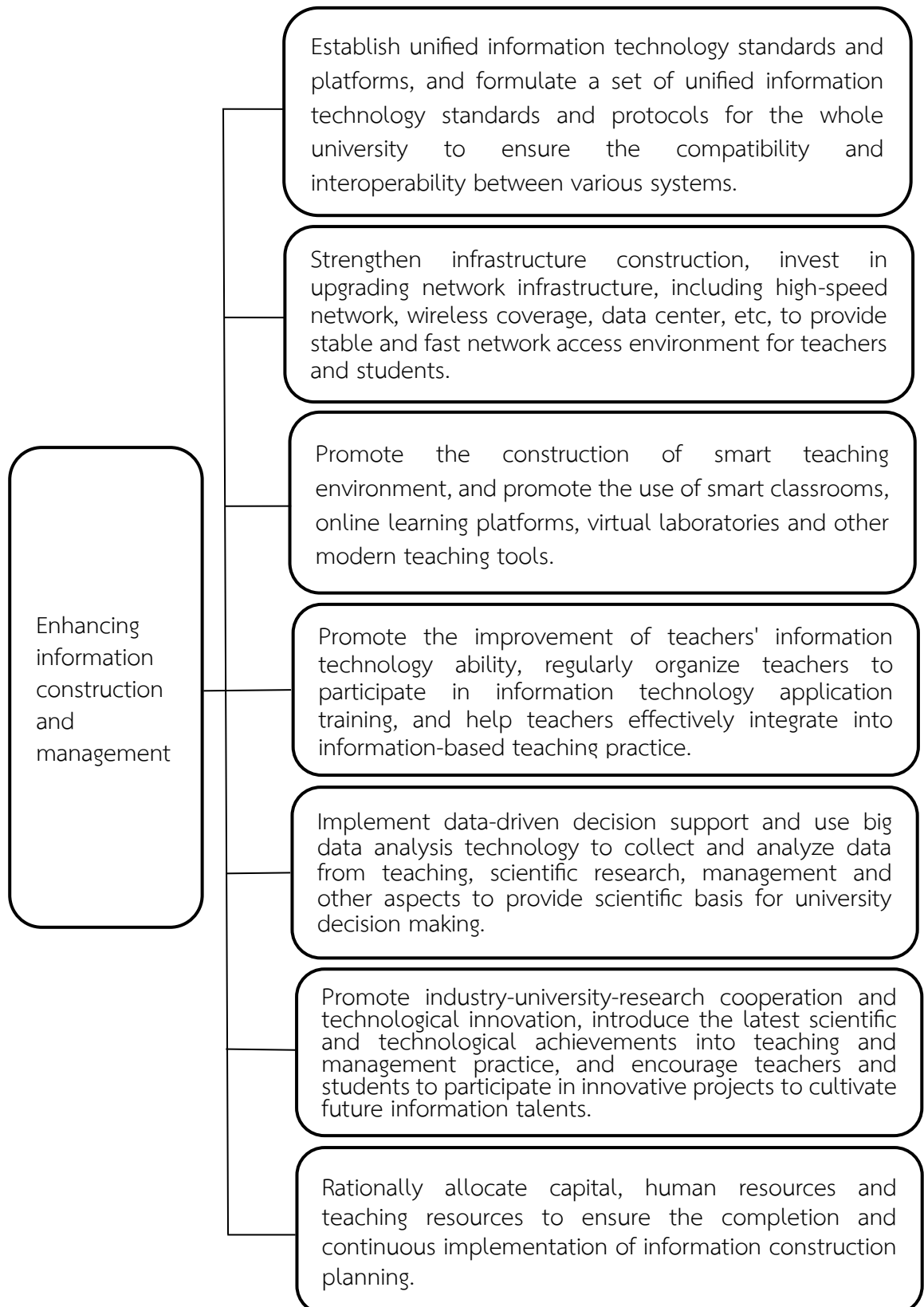
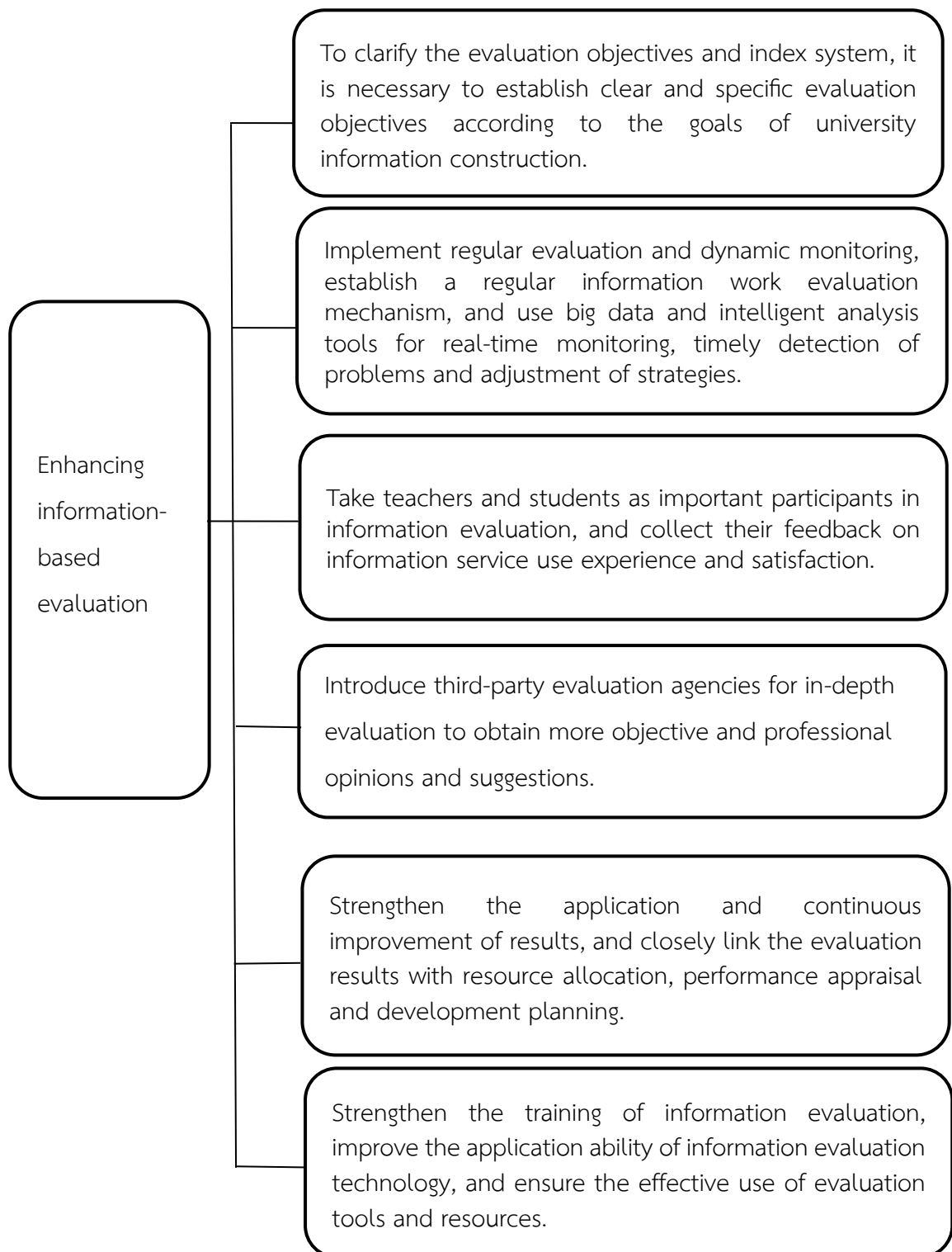


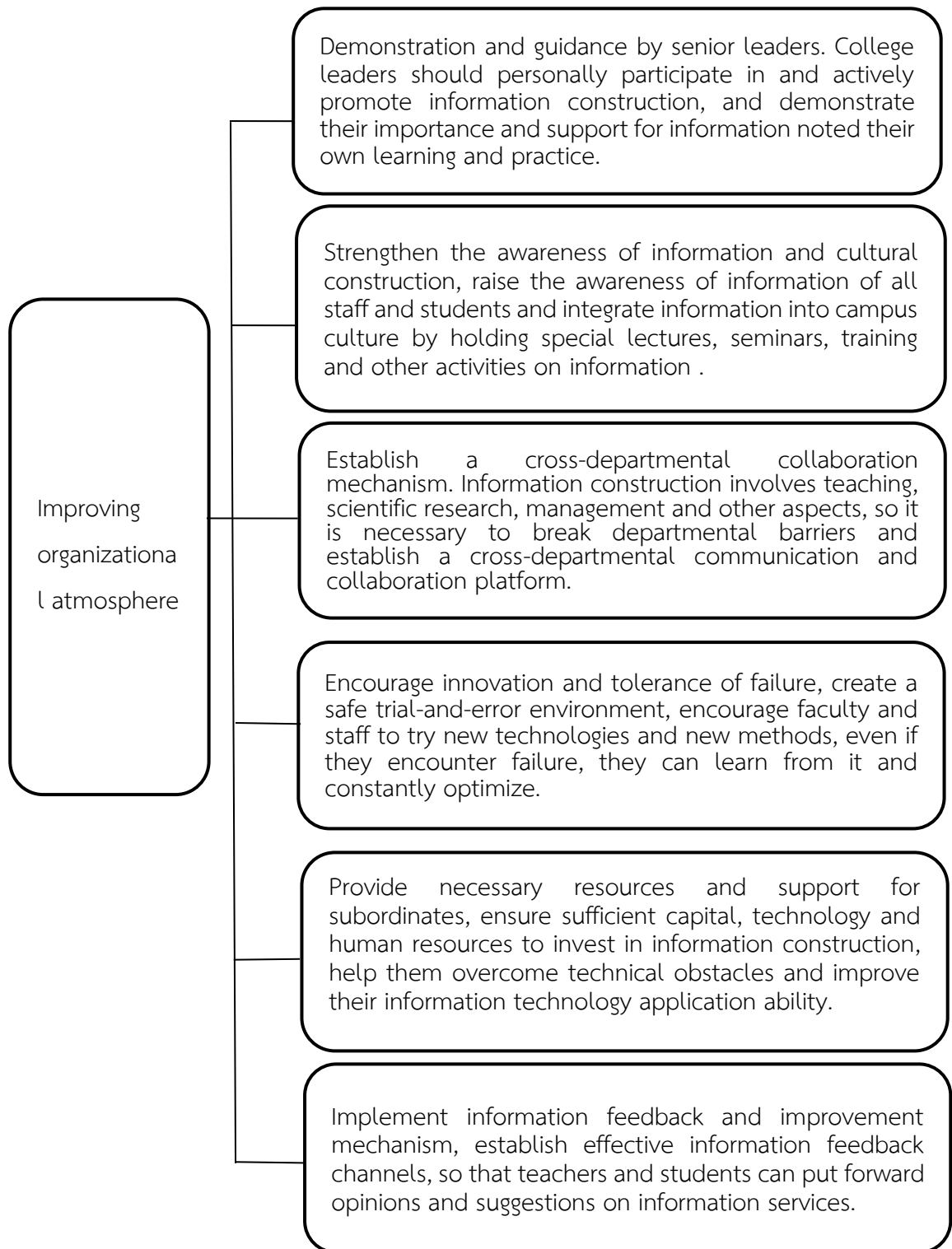
Figure 4.3 Model for promoting information



**Figure 4.4** Model for enhancing information construction and management



**Figure 4.5** Model for enhancing information-based evaluation



**Figure 4.6** Model for promoting improving organizational atmosphere



Part 4: The analysis results about the evaluation of the suitability and feasibility of model for improving information leadership of middle-level administrators in public universities in Zhejiang Presented the data in the form of level and standard deviation.

**Table 4.10** The mean and standard deviation of the evaluation of the suitability and feasibility of model for improving information leadership of middle-level administrators in five aspects

(N = 9)

No	model for improving information leadership of middle-level administrators	Suitability		level	Feasibility		level
		$\bar{X}$	S.D.		$\bar{X}$	S.D.	
1	Improving information literacy	4.62	0.62	highest	4.44	0.66	high
2	Promoting information vision	4.34	0.68	high	4.48	0.63	high
3	Enhancing information construction and management	4.66	0.77	highest	4.52	0.71	highest
4	Enhancing information-based evaluation	4.39	0.70	high	4.50	0.60	highest
5	Improving organizational atmosphere	4.44	0.63	high	4.41	0.61	high
<b>Total</b>		<b>4.49</b>	<b>0.68</b>	<b>high</b>	<b>4.47</b>	<b>0.64</b>	<b>high</b>

According to Table 4.10, the suitability of model for improving information leadership of middle-level administrators in high level ( $\bar{X}$  =4.49) .Considering the result of this research aspects ranging form the highest to lowest mean were as follows: the highest mean enhancing information construction and management ( $\bar{X}$  =4.66) , followed by improving information literacy ( $\bar{X}$  =4.66) , improving organizational atmosphere ( $\bar{X}$  =4.44) , enhancing information-based evaluation ( $\bar{X}$  =4.50) , promoting information vision is the lowest mean ( $\bar{X}$  =4.34) .The feasibility of model for improving information leadership of middle-level administrators in high level ( $\bar{X}$  =4.47) .Considering the result of this research aspects ranging form the highest to lowest mean were as follows: the highest mean enhancing information construction

and management ( $\bar{x}$  =4.52) , followed by enhancing information-based evaluation ( $\bar{x}$  =4.50) , promoting information vision ( $\bar{x}$  =4.48) , improving information literacy ( $\bar{x}$  =4.39) , improving organizational atmosphere is the lowest mean ( $\bar{x}$  =4.41) .

**Table 4.11** The mean and standard deviation of the evaluation of the suitability and feasibility of model for improving information leadership of middle-level administrators in information literacy

(N = 9)

No	Improving information literacy	Suitability		level	Feasibility		level
		$\bar{x}$	S.D.		$\bar{x}$	S.D.	
1	Enhance information awareness, cultivate sensitivity to information and value judgment, take the initiative to pay attention to current events, industry trends and professional knowledge, and form a cognitive habit of the importance of information.	4.44	0.73	high	4.33	0.71	high
2	Administrators information skills, learn and Administrators basic computer operations, including but not limited to operating systems, office software, Internet search skills and the installation and use of commonly used application software.	4.44	0.73	high	4.56	0.73	highest
3	Improve information retrieval ability, Administrators advanced skills in using library resources, databases and Internet search engines, and be able to quickly and accurately locate required information resources.	4.56	0.53	highest	4.67	0.50	highest

Table 4.11 (Continue)

(N = 9)

No	Improving information literacy	Suitability		level	Feasibility		level
		$\bar{X}$	S.D.		$\bar{X}$	S.D.	
4	Information processing and analysis, developing the ability of information classification, screen verification and integration, using statistical software, data analysis tools to improve the efficiency of data processing.	4.44	0.73	high	4.33	0.71	high
5	Strengthen information security and privacy protection, enhance the understanding of network security threats, learn how to protect personal information, including setting passwords, identifying phishing and other fraud, and comply with relevant laws.	4.56	0.73	highest	4.67	0.71	highest
6	Cultivate information ethics and social responsibility, establish correct information ethics, respect copyright, protect the privacy of others, do not spread false information, and actively participate in building a healthy information environment.	4.67	0.71	highest	4.67	0.71	highest
Total		4.52	0.69	highest	4.54	0.68	highest

According to Table 4.11, the suitability of model for improving information literacy of middle-level administrators in highest level ( $\bar{x}=4.52$ ). Considering the result of this research aspects ranging from the highest to lowest mean were as follows: the highest mean culcate information ethics and social responsibility ( $\bar{x}=4.67$ ), followed by improve information retrieval ability ( $\bar{x}=4.56$ ), enhance information awareness is the lowest mean ( $\bar{x}=4.44$ ). The feasibility of model for improving information literacy of middle-level administrators in highest mean ( $\bar{x}=4.54$ ). Considering the result of this research aspects ranging from the highest to lowest mean were as follows: the highest mean culcate information ethics and social responsibility ( $\bar{x}=4.67$ ), followed by strengthen information security and privacy protection ( $\bar{x}=4.67$ ), enhance information awareness is the lowest mean ( $\bar{x}=4.33$ ).

**Table 4.12** The mean and standard deviation of the evaluation of the suitability and feasibility of model for improving information leadership of middle-level administrators in promoting information vision

(N = 9)

No	Promoting information vision	Suitability		level	Feasibility		level
		$\bar{x}$	S.D.		$\bar{x}$	S.D.	
1	Formulate information development strategy, clarify the long-term goal of information development of universities, and provide clear direction and long-term, medium and short-term information vision planning for all teachers and students.	4.11	0.60	high	4.44	0.73	high

Table 4.12 (Continue)

(N = 9)

No	Promoting information vision	Suitability		level	Feasibility		level
		$\bar{x}$	S.D.		$\bar{x}$	S.D.	
2	Strengthen the construction of information infrastructure, improve the construction level of campus network, data center, cloud computing and other infrastructure, and provide stable and efficient technical support for information applications.	4.44	0.73	high	4.56	0.53	highest
3	Promote information-based teaching, utilize information technology means, innovate teaching methods, improve teaching effects, and meet students' personalized learning needs.	4.22	0.67	high	4.33	0.71	high
4	Build a digital campus, promote the digitization of campus management, service, office and other aspects, and improve the efficiency of campus management and service quality.	4.33	0.50	high	4.44	0.53	high

Table 4.12 (Continue)

(N = 9)							
No	Promoting information vision	Suitability		level	Feasibility		level
		$\bar{x}$	S.D.		$\bar{x}$	S.D.	
5	Strengthen information security guarantee, establish and improve information security management system, improve teachers and students' awareness of information security, and prevent network attacks and data leaks.	4.56	0.73	highest	4.67	0.71	highest
6	Strengthen the training of information talents, and improve the information literacy and application ability of teachers and students by offering relevant courses and training.	4.67	0.50	highest	4.78	0.44	highest
7	Strengthen international exchanges and cooperation in information , and improve the international level of information construction in universities by participating in international academic conferences and introducing foreign advanced technologies.	4.39	0.62	high	4.53	0.60	highest
Total		4.39	0.62	high	4.54	0.61	highest

According to Table 4.12, the suitability of model for promoting information vision of middle-level administrators in high level ( $\bar{x}=4.39$ ). Considering the result of this research aspects ranging from the highest to lowest mean were as follows: the highest mean strengthen the training of information talents ( $\bar{x}=4.67$ ), followed by strengthen information security guarantee ( $\bar{x}=4.56$ ), formulate information development strategy is the lowest level ( $\bar{x}=4.44$ ). The feasibility of model for promoting information vision of middle-level administrators in highest level ( $\bar{x}=4.54$ ). Considering the result of this research aspects ranging from the highest to lowest mean were as follows: the highest mean strengthen the training of information talents ( $\bar{x}=4.78$ ), followed by strengthen information security guarantee ( $\bar{x}=4.67$ ), promote information-based teaching is the lowest mean ( $\bar{x}=4.33$ ).

**Table 4.13** The mean and standard deviation of the evaluation of the suitability and feasibility of model for improving information leadership of middle-level administrators in enhancing information construction and management

(N = 9)

No	Enhancing information construction and management	Suitability		level	Feasibility		level
		$\bar{x}$	S.D.		$\bar{x}$	S.D.	
1	Establish unified information technology standards and platforms, and formulate a set of unified information technology standards and protocols for the whole university to ensure the compatibility and interoperability between various systems.	4.56	0.53	highest	4.44	0.53	high

Table 4.13 (Continue)

(N = 9)

No	Enhancing information construction and management	Suitability		level	Feasibility		level
		$\bar{x}$	S.D.		$\bar{x}$	S.D.	
2	Strengthen infrastructure construction, invest in upgrading network infrastructure, including high-speed network, wireless coverage, data center, etc, to provide stable and fast network access environment for teachers and students.	4.44	0.73	high	4.33	0.71	high
3	Promote the construction of smart teaching environment, and promote the use of smart classrooms, online learning platforms, virtual laboratories and other modern teaching tools.	4.22	0.83	high	4.44	0.88	high
4	Promote the improvement of teachers' information technology ability, regularly organize teachers to participate in information technology application training, and help teachers effectively integrate into -based teaching practice.	4.22	0.83	high	4.44	0.88	high



Table 4.13 (Continue)

(N = 9)

No	Enhancing information construction and management	Suitability		level	Feasibility		level
		$\bar{x}$	S.D.		$\bar{x}$	S.D.	
5	Implement data-driven decision support and use big data analysis technology to collect and analyze data from teaching, scientific research, management and other aspects to provide scientific basis for university decision making.	4.67	0.71	highest	4.56	0.73	highest
6	Promote industry-university-research cooperation and technological innovation, introduce the latest scientific and technological achievements into teaching and management practice, and encourage teachers and students to participate in innovative projects to cultivate future information talents.	4.78	0.44	highest	4.67	0.50	highest
7	Rationally allocate capital, human resources and teaching resources to ensure the completion and continuous implementation of information construction planning.	4.22	0.67	high	4.22	0.67	high
Total		4.44	0.68	high	4.44	0.70	high

According to Table 4.13, the suitability of model for enhancing information construction and management of middle-level administrators in high level ( $\bar{x}=4.44$ ) .Considering the result of this research aspects ranging form the highest to lowest mean were as follows: the highest mean promote technological innovation ( $\bar{x}=4.78$ ) , followed by implement data-driven decision support ( $\bar{x}=4.67$ ) , promote the improvement of teachers' ability is the lowest mean ( $\bar{x}=4.22$ ) .The feasibility of model for enhancing information construction and management of middle-level administrators in high level ( $\bar{x}=4.44$ ) .Considering the result of this research aspects ranging form the highest to lowest mean were as follows: the highest mean promote technological innovation ( $\bar{x}=4.67$ ) , followed by implement data-driven decision support ( $\bar{x}=4.56$ ) , pationally allocate capital is the lowest mean ( $\bar{x}=4.22$ ).

**Table 4.14** The mean and standard deviation of the evaluation of the suitability and feasibility of model for improving information leadership of middle-level administrators in enhancing information-based evaluation

(N = 9)

No	Enhancing information-based evaluation	Suitability		level	Feasibility		level
		$\bar{x}$	S.D.		$\bar{x}$	S.D.	
1	To clarify the evaluation objectives and index system, it is necessary to establish clear and specific evaluation objectives according to the goals of university information construction.	4.44	0.73	high	4.44	0.73	high

Table 4.14 (Continue)

(N = 9)

No	Enhancing information-based evaluation	Suitability		level	Feasibility		level
		$\bar{x}$	S.D.		$\bar{x}$	S.D.	
2	Implement regular evaluation and dynamic monitoring, establish a regular information work evaluation mechanism, and use big data and intelligent analysis tools for real-time monitoring, timely detection of problems and adjustment of strategies.	4.33	0.71	high	4.56	0.73	highest
3	Take teachers and students as important participants in information evaluation, and collect their feedback on information service use experience and satisfaction.	4.33	0.71	high	4.56	0.73	highest
4	Introduce third-party evaluation agencies for in-depth evaluation to obtain more objective and professional opinions and suggestions.	4.44	0.53	high	4.67	0.50	highest
5	Strengthen the application and continuous improvement of results, and closely link the evaluation results with resource allocation, performance appraisal and development planning.	4.11	0.93	high	4.33	0.87	high

Table 4.14 (Continue)

(N = 9)							
No	Enhancing information-based evaluation	Suitability		level	Feasibility		level
		$\bar{x}$	S.D.		$\bar{x}$	S.D.	
6	Strengthen the training of information evaluation, improve the application ability of information evaluation technology, and ensure the effective use of evaluation tools and resources.	4.44	0.73	high	4.67	0.50	highest
Total		4.35	0.72	high	4.54	0.65	highest

According to Table 4.14, the suitability of model for enhancing information-based evaluation of middle-level administrators in high level ( $\bar{x}=4.35$ ). Considering the result of this research aspects ranging from the highest to lowest mean were as follows: the highest mean to clarify the evaluation index system ( $\bar{x}=4.44$ ), followed by introduce third-party evaluation agencies ( $\bar{x}=4.44$ ), continuous improvement of results of results is the lowest mean ( $\bar{x}=4.11$ ). The feasibility of model for enhancing information-based evaluation of middle-level administrators in highest level ( $\bar{x}=4.54$ ). Considering the result of this research aspects ranging from the highest to lowest mean were as follows: the highest mean introduce third-party evaluation agencies ( $\bar{x}=4.67$ ), followed by strengthen the training of information evaluation ( $\bar{x}=4.67$ ), continuous improvement of results is the lowest mean ( $\bar{x}=4.33$ ).

**Table 4.15** The mean and standard deviation of the evaluation of the suitability and feasibility of model for improving information leadership of middle-level administrators in improving organizational atmosphere

(N = 9)

No	Improving organizational atmosphere	Suitability		level	Feasibility		level
		$\bar{x}$	S.D.		$\bar{x}$	S.D.	
1	Demonstration and guidance by senior leaders. College leaders should personally participate in and actively promote information construction, and demonstrate their importance and support for information noted their own learning and practice.	4.56	0.53	highest	4.44	0.53	high
2	Strengthen the awareness of information and cultural construction, raise the awareness of information of all staff and students and integrate information into campus culture by holding special lectures, seminars, training and other activities on information .	4.56	0.53	highest	4.44	0.53	high

Table 4.15 (Continue)

(N = 9)

No	Improving organizational atmosphere	Suitability		level	Feasibility		level
		$\bar{x}$	S.D.		$\bar{x}$	S.D.	
3	Establish a cross-departmental collaboration mechanism. Information construction involves teaching, scientific research, management and other aspects, so it is necessary to break departmental barriers and establish a cross-departmental communication and collaboration platform.	4.56	0.73	highest	4.44	0.73	high
4	Encourage innovation and tolerance of failure, create a safe trial-and-error environment, encourage faculty and staff to try new technologies and new methods, even if they encounter failure, they can learn from it and constantly optimize.	4.11	0.78	high	4.11	0.78	high
5	Provide necessary resources and support for subordinates, ensure sufficient capital, technology and human resources to invest in information construction, help them overcome technical obstacles and improve their information technology application ability.	4.33	0.50	high	4.33	0.50	high

Table 4.15 (Continue)

(N = 9)							
No	Improving organizational atmosphere	Suitability		level	Feasibility		level
		$\bar{x}$	S.D.		$\bar{x}$	S.D.	
6	Implement information feedback and improvement mechanism, establish effective information feedback channels, so that teachers and students can put forward opinions and suggestions on information services.	4.22	0.67	high	4.22	0.67	high
Total		4.44	0.68	high	4.44	0.70	high

According to Table 4.15, the suitability of model for improving organizational atmosphere of middle-level administrators in high level ( $\bar{x}=4.44$ ). Considering the result of this research aspects ranging from the highest to lowest mean were as follows: the highest mean establish a cross-departmental collaboration mechanism ( $\bar{x}=4.56$ ), followed by guidance senior leaders ( $\bar{x}=4.56$ ), encourage innovation and tolerance of failure of results is the lowest mean ( $\bar{x}=4.11$ ). The feasibility of model for improving organizational atmosphere of middle-level administrators in highest level ( $\bar{x}=4.44$ ). Considering the result of this research aspects ranging from the highest to lowest mean were as follows: the highest mean establish a cross-departmental collaboration mechanism ( $\bar{x}=4.44$ ), followed by guidance senior leaders ( $\bar{x}=4.44$ ), encourage innovation and tolerance of failure is the lowest mean ( $\bar{x}=4.33$ ).

## Chapter 5

### Conclusion Discussion and Recommendations

The research in the model for improving information leadership of middle-level administrators in public universities in Zhejiang. The objectives of this research were 1) to study the current situation of information leadership of middle-level administrators in public universities in Zhejiang, 2) To develop model for improving information leadership of middle-level administrators in public universities in Zhejiang, and 3) To evaluate the adaptability and feasibility of model for improving information leadership of middle-level administrators in public universities in Zhejiang were including 5 following aspects: 1) information literacy, 2) information vision, 3) Information construction and management, 4) information-based evaluation, and 5) organizational atmosphere. The sample group in this research were administrators in 5 universities in Zhejiang. The interviewees in this research were 10 administrators come from each of 5 universities-select 2 administrators from each university. The experts for evaluation of the suitability and feasibility of model for improving information leadership of middle-level administrators in public universities in Zhejiang were 9 experts, they come from universities in Zhejiang. The research instruments were documents analysis, questionnaire, structured interview and evaluation form. The statistic to analyze the data were percentage, mean and standard deviation.

The details are as follows.

#### Conclusion

The research in the model for improving information leadership of middle-level administrators in public universities in Zhejiang. The researcher summarizes the conclusion into 3 parts, details as follows:

Part 1: The current situation of information leadership of middle-level administrators in public universities in Zhejiang

Part 2: The model for improving information leadership of middle-level administrators in public universities in Zhejiang.



Part 3: The suitability and feasibility of model for improving information leadership of middle-level administrators in public universities in Zhejiang.

**Part 1: The current situation of information leadership of middle-level administrators in public universities in Zhejiang**

The current situation of information leadership of middle-level administrators in five aspects was at high level. Considering the results of this research aspects ranged from the highest to lowest mean were as follows: the highest mean was information vision, follow by information literacy, and information-based evaluation was the lowest mean.

**Information literacy** was at high level. Considering the results of this research aspects ranged from the highest to lowest mean were as follows: the highest mean was middle-level administrators have a strong sense of information responsibility, follow by middle-level administrators recognize the latest development trend of educational information, and middle-level administrators be more interested in emerging information technology was the lowest mean.

**Information vision** was at high level. Considering the results of this research aspects ranged from the highest to lowest mean were as follows: the highest mean was middle-level administrators lead the formulation of the department's long-range, medium and near-term information vision planning, follow by middle-level administrators often organize information vision exchange activities, and middle-level administrators make timely adjustments to information vision planning in the process of information construction was the lowest mean.

**Information construction and management** was at high level. Considering the results of this research aspects ranged from the highest to lowest mean were as follows: the highest mean was middle-level administrators reasonably allocate funds, human resources and teaching resources to ensure the completion and continuous implementation of information construction planning, follow by middle-level administrators effectively implement, administrators, supervise and plan the work content related to information technology, and middle-level administrators lead the construction of university information-based teaching resources was the lowest mean.

**Information-based evaluation** was at high level. Considering the results of this research aspects ranged from the highest to lowest mean were as follows: the highest mean was middle-level administrators regularly organize the evaluation of the university's information vision planning and implementation, follow by middle-level administrators often use information methods for administrators or evaluation, and middle-level administrators clearly identify the current development status of university education information was the lowest mean.

**Organizational atmosphere** was at high level. Considering the results of this research aspects ranged from the highest to lowest mean were as follows: the highest mean was middle-level administrators support each other and help subordinates, follow by middle-level administrators implement the people-oriented administrators concept everywhere, and middle-level administrators implement the people-oriented administrators concept everywhere was the lowest mean.

## **Part 2: The model for improving information leadership of middle-level administrators in public universities in Zhejiang.**

The model for improving information leadership of middle-level administrators in five aspects, which contain 32 measures. There are 6 measures for improving information literacy, 7 measures for promoting information vision, 7 measures for enhancing Information construction and management, 6 measures for enhancing information-based evaluation, 6 measures for improving organizational atmosphere.

**Improving information literacy** consisted of 6 measures: 1) Enhance information awareness, cultivate sensitivity to information and value judgment, take the initiative to pay attention to current events, industry trends and professional knowledge, and form a cognitive habit of the importance of information.y. 2) Master information skills, learn and master basic computer operations, including but not limited to operating systems, office software (such as Word, Excel) , Internet search skills and the installation and use of commonly used application software. 3) Improve information retrieval ability, master advanced skills in using library resources, databases and Internet search engines, and be able to quickly and accurately locate required information resources. 4) Information processing and analysis, developing the ability of information classification, screening, verification and integration, using

statistical software, data analysis tools and programming languages to improve the efficiency of data processing and information analysis. 5) Strengthen information security and privacy protection, enhance the understanding of network security threats, learn how to protect personal information, including setting strong passwords, identifying phishing and other fraud, and comply with relevant laws and regulations. 6) Cultivate information ethics and social responsibility, establish correct information ethics, respect copyright, protect the privacy of others, do not spread false information, and actively participate in building a healthy information environment.

**Promoting information vision** consisted of 7 measures: 1) Formulate information development strategy, clarify the long-term goal of information development of universities, and provide clear direction and long-term, medium and short-term information vision planning for all teachers and students. 2) Strengthen the construction of information infrastructure, improve the construction level of campus network, data center, cloud computing and other infrastructure, and provide stable and efficient technical support for information applications. compatible with the development of the university. 3) Promote information-based teaching, utilize information technology means, innovate teaching methods, improve teaching effects, and meet students' personalized learning needs. 4) Build a digital campus, promote the digitization of campus administrators, service, office and other aspects, and improve the efficiency of campus administrators and service quality. 5) Strengthen information security guarantee, establish and improve information security administrators system, improve teachers and students' awareness of information security, and prevent network attacks and data leaks. 6) Strengthen the training of information talents, and improve the information literacy and application ability of teachers and students by offering relevant courses and training. 7) Strengthen international exchanges and cooperation in information, and improve the international level of information construction in universities by participating in international academic conferences and introducing foreign advanced technologies.

**Enhancing information construction and management** consisted of 7 measures: 1) Establish unified information technology standards and platforms, and formulate a set of unified information technology standards and protocols for the

whole university to ensure the compatibility and interoperability between various systems. 2) Strengthen infrastructure construction, invest in upgrading network infrastructure, including high-speed network, wireless coverage, data center, etc, to provide stable and fast network access environment for teachers and students. 3) Promote the construction of smart teaching environment, and promote the use of smart classrooms, online learning platforms, virtual laboratories and other modern teaching tools. 4) Promote the improvement of teachers' information technology ability, regularly organize teachers to participate in information technology application training, and help teachers effectively integrate into information-based teaching practice. 5) Implement data-driven decision support and use big data analysis technology to collect and analyze data from teaching, scientific research, administrators and other aspects to provide scientific basis for university decision making. 6) Promote industry-university-research cooperation and technological innovation, introduce the latest scientific and technological achievements into teaching and administrators practice, and encourage teachers and students to participate in innovative projects to cultivate future information talents. 7) Rationally allocate capital, human resources and teaching resources to ensure the completion and continuous implementation of information construction planning.

**Enhancing information-based evaluation** consisted of 6 measures: 1) To clarify the evaluation objectives and index system, it is necessary to establish clear and specific evaluation objectives according to the goals of university information construction. 2) Implement regular evaluation and dynamic monitoring, establish a regular information work evaluation mechanism, and use big data and intelligent analysis tools for real-time monitoring, timely detection of problems and adjustment of strategies. 3) Take teachers and students as important participants in information evaluation, and collect their feedback on information service use experience and satisfaction. 4) Introduce third-party evaluation agencies for in-depth evaluation to obtain more objective and professional opinions and suggestions. 5) Strengthen the application and continuous improvement of results, and closely link the evaluation results with resource allocation, performance appraisal and development planning. 6) Strengthen the training of information evaluation, improve the application ability of

information evaluation technology, and ensure the effective use of evaluation tools and resources.

**Improving organizational atmosphere** consisted of 6 measures:

1) Demonstration and guidance by senior leaders. College leaders should personally participate in and actively promote information construction, and demonstrate their importance and support for information noted their own learning and practice. 2) Strengthen the awareness of information and cultural construction, raise the awareness of information of all staff and students and integrate information into campus culture by holding special lectures, seminars, training and other activities on information . 3) Establish a cross-departmental collaboration mechanism. Information construction involves teaching, scientific research, administrators and other aspects, so it is necessary to break departmental barriers and establish a cross-departmental communication and collaboration platform. 4) Encourage innovation and tolerance of failure, create a safe trial-and-error environment, encourage faculty and staff to try new technologies and new methods, even if they encounter failure, they can learn from it and constantly optimize. 5) Provide necessary resources and support for subordinates, ensure sufficient capital, technology and human resources to invest in information construction, help them overcome technical obstacles and improve their information technology application ability. 6) Implement information feedback and improvement mechanism, establish effective information feedback channels, so that teachers and students can put forward opinions and suggestions on information services.

### **Part 3: The suitability and feasibility of model for improving information leadership of middle-level administrators in public universities in Zhejiang.**

The suitability of model for improving information leadership of middle-level administrators in high level. Considering the result of this research aspects ranging from the highest to lowest mean were as follows: the highest mean enhancing information construction and management, followed by improving information literacy, improving organizational atmosphere, enhancing information-based evaluation, promoting information vision is the lowest mean.

1. The suitability of model for improving information literacy of middle-level administrators in highest level. Considering the result of this research aspects ranging from the highest to lowest mean were as follows: the highest mean culcate information ethics and social responsibility, followed by improve information retrieval ability , enhance information awareness is the lowest mean.

2. The suitability of model for promoting information vision of middle-level administrators in high level. Considering the result of this research aspects ranging from the highest to lowest mean were as follows: the highest mean strengthen the training of information talents, followed by strengthen information security guarantee, formulate information development strategy is the lowest mean.

3. The suitability of model for enhancing information construction and management of middle-level administrators in high level. Considering the result of this research aspects ranging from the highest to lowest mean were as follows: the highest mean promote technological innovation, followed by implement data-driven decision support , promote the improvement of teachers' ability is the lowest mean.

4. The suitability of model for enhancing information-based evaluation of middle-level administrators in high level. Considering the result of this research aspects ranging from the highest to lowest mean were as follows: the highest mean to clarify the evaluation index system, followed by introduce third-party evaluation agencies, continuous improvement of results of results is the lowest mean.

5. The suitability of model for improving organizational atmosphere of middle-level administrators in high level. Considering the result of this research aspects ranging from the highest to lowest mean were as follows: the highest mean establish a cross-departmental collaboration mechanism, followed by guidance senior leaders, encourage innovation and tolerance of failure of results is the lowest mean.

The feasibility of model for improving information leadership of middle-level administrators in high level. Considering the result of this research aspects ranging from the highest to lowest mean were as follows: the highest mean enhancing information construction and management, followed by enhancing information-based evaluation, promoting information vision, improving information literacy, improving organizational atmosphere is the lowest mean.

1. The feasibility of model for improving information literacy of middle-level administrators in highest level. Considering the result of this research aspects ranging from the highest to lowest mean were as follows: the highest mean culcate information ethics and social responsibility, followed by strengthen information security and privacy protection, enhance information awareness is the lowest mean.

2. The feasibility of model for promoting information vision of middle-level administrators in highest level. Considering the result of this research aspects ranging from the highest to lowest mean were as follows: the highest mean strengthen the training of information talents, followed by strengthen information security guarantee, promote information-based teaching is the lowest mean.

3. The feasibility of model for enhancing information construction and management of middle-level administrators in high level. Considering the result of this research aspects ranging from the highest to lowest mean were as follows: the highest mean promote technological innovation, followed by implement data-driven decision support, pationally allocate capital is the lowest mean.

4. The feasibility of model for enhancing information-based evaluation of middle-level administrators in highest level. Considering the result of this research aspects ranging from the highest to lowest mean were as follows: the highest mean introduce third-party evaluation agencies, followed by strengthen the training of information evaluation, continuous improvement of results is the lowest mean.

5. The feasibility of model for improving organizational atmosphere of middle-level administrators in highest level. Considering the result of this research aspects ranging from the highest to lowest mean were as follows: the highest mean establish a cross-departmental collaboration mechanism, followed by guidance senior leaders , encourage innovation and tolerance of failure is the lowest mean.

## Discussion

The research in the model for improving information leadership of middle-level administrators in public universities in Zhejiang. The researcher summarizes the discussion into 3 parts, details as follows:

Part 1: The current situation of information leadership of middle-level administrators in public universities in Zhejiang

Part 2: The model for improving information leadership of middle-level administrators in public universities in Zhejiang.

Part 3: The suitability and feasibility of model for improving information leadership of middle-level administrators in public universities in Zhejiang.

### **Part 1: The current situation of information leadership of middle-level administrators in public universities in Zhejiang**

The current situation of information leadership of middle-level administrators in five aspects was at high level. Considering the results of this research aspects ranged from the highest to lowest mean were as follows: the information leadership public universities in high mean. Considering the result of this research aspects ranging from the highest to lowest mean were as follows: the highest mean information vision, followed by information literacy, organizational atmosphere, information construction and management, information-based evaluation is the lowest mean. The highest mean information vision, this may be because it is of great significance to formulate a reasonable vision of information to improve the information leadership of middle managers. It can not only point out the direction for individuals and teams, but also stimulate motivation, improve efficiency and promote growth. First, an information-based vision provides clear direction. A sound information vision can give employees a clear idea of what they are working towards, which helps reduce the sense of confusion at work and ensures that everyone is working towards a common vision. Secondly, the information vision can optimize the allocation of resources. A clear vision helps managers allocate resources, including time, people, and money, to ensure that critical tasks are prioritized and that resources are not wasted on non-core activities. Finally, the information-based vision enhances teamwork. When team members share clear goals, it fosters better communication and cooperation. Shared goals help team



members support each other and work together to achieve overall success. The conclusion of this study is basically consistent with the conclusions of Li Chaoping (2010, p.243) , and Wang Shuhua (2022) on information leadership. Sound vision setting is the cornerstone of work planning and management, which can not only improve work efficiency and team cohesion, but also stimulate individual potential and drive the organization to continue moving forward.

**1. Information literacy** was at high level. This is because the middle administrators of universities in Zhejiang still have some shortcomings in information awareness, and their ability to convert data into information and information into university-running decision-making is low, which is still far from the basic quality that administrators should possess to support university-running and university-running. Wang Shuhua (2022, p.111). This shows that there is still room for administrators to improve their awareness of data acquisition, processing and analysis. From the information literacy of the questionnaire survey results, the average value of middle administrators with strong information responsibility is the highest. This is because Zhejiang universities attach great importance to the influence of the concept of information responsibility on middle administrators, and set relevant matters in the selection of middle administrators. Related to the concept of Li Chaoping (2010, p.422), university information literacy is very important for middle administrators. The lowest average is that middle administrators are more interested in emerging information technology, which is because Zhejiang universities still have shortcomings in emerging information technology. The middle administrators of universities fail to adopt the emerging information technology effectively and are unwilling to learn it. In terms of training, universities fail to integrate resources, train middle administrators in universities, and form a sufficient number of information teams. Related to Jinzhi (1985, p.33) idea, universities should not only set up special funds for learning emerging information technologies, but also support middle administrators to make full use of resources to learn emerging information technologies.

**2. Information vision** was at high level. This is because most of the universities in Zhejiang pay attention to the leadership of the information vision of middle administrators. Although the vision of information can be improved in the short

term, the relative lack of corresponding systems leads to the implementation of the vision of information. Related to the concept of James Kouzes (2014,p.244), system is an important means to enhance the vision of information, so it is of great significance to formulate corresponding system according to the characteristics of middle administrators. From the information perspective of the questionnaire survey results, the middle administrators take the lead in making long-term, medium and short-term information vision plans of their departments on average. This is because in recent years, in order to strengthen the leadership of middle administrators in information technology, Zhejiang universities require middle administrators to formulate corresponding information vision according to the needs of different levels, and the implementation effect is good. The level of information in universities has increased significantly. Related to the concept of Wang Li (2019, p.22), it has become an important means of information for universities that middle administrators take the lead in formulating long-term, medium and short-term information vision planning of their own departments. universities should fully consider the job title, work experience, fairness and other factors that have a great impact on the formulation of information vision, and design an information vision that combines efficiency and fairness, commonness and characteristics. The lowest average is that middle administrators timely adjust the information vision planning in the process of information construction. This is because Zhejiang universities do not make timely adjustment after formulating the information vision, and do not take into account the changes of society and science and technology. The formulated vision cannot be timely adjusted, which increases the risk of vision realization. Related to the concept of Qin Sheng (2021, p.6), in the context of the information age, with the rapid development of science and technology.

**3. Information construction and management** was at high level. This is because in the process of information leadership of middle administrators, there is still a phenomenon of "emphasizing appearance, undervaluing connotation" and "emphasizing form, undervaluing assessment". At the same time, one-sided pursuit of hard indicators has also led to the imperfection of Information construction and management in universities. The level, benefit and efficiency of Information

construction and management in universities need to be fully reflected noted the comprehensive evaluation of middle administrators, so it is necessary to make up for the deficiency of evaluation of Information construction and management of middle administrators in time. Related to the concept of Wen Hongbo (2012, p.3), how to better strengthen the assessment of middle administrators and realize the comprehensive tracking, assessment and evaluation of information administrators of middle administrators should be the focus of information leadership promotion of middle administrators in the future. From the Information construction and management results of the questionnaire survey, Middle-level administrators reasonably allocate funds, human resources and teaching resources to ensure the completion and continuous implementation of information The average value of construction planning is the highest, because reasonable allocation of capital, human resources and teaching resources is the most important function of middle administrators. In order to improve the information of universities, universities pay more attention to the coordination effect of middle administrators in the promotion of information leadership. Related to the views of Wang Shuhua (2022, p.109), reasonable allocation of capital, human resources and teaching resources is a necessary link for middle administrators in universities to perform their functions. How to allocate resources scientifically, objectively and efficiently is an important task faced by middle administrators in universities, and also an important factor affecting the leadership development of middle administrators in universities. The lowest is Middle-level administrators lead the construction of university information-based teaching resources, This is because the mode of middle administrators leading the construction of teaching resources in universities is not innovative enough, the form is relatively simple, too much attention to teachers' self-administrators, and the assessment of the results of teaching resources construction is one-sided. As a result, the formulation of assessment standards does not conform to the law of information development. Related to the concept of Wang Li (2019, p.23) , teaching resource construction should adopt different standards and administrators methods for different types of talents, so as to make teaching resource administrators more targeted and avoid simple and unified standards.

**4. Information-based evaluation** was at high level. This is because Zhejiang universities have a relatively strong evaluation system for the information-based leadership of middle administrators, develop concepts in the evaluation indicators simultaneously, and commit to creating a "soil" information-based environment conducive to work and life in universities. From the information evaluation of questionnaire survey results, Middle-level administrators regularly organize the evaluation of the university's information vision planning and The average value of implementation is the highest, which is because universities attach great importance to regularly organizing the evaluation of the university information vision planning and implementation. The middle-level administrators' improvement of the university information effect is highly respected and recognized, which enhances the middle-level administrators' sense of career honor and satisfaction. Related to the concept of Wang Shuhua (2022, p.38), universities should actively implement the development concept of regular evaluation, improve the mechanism of regular information evaluation, and highlight the important position and role of middle administrators in college information evaluation. The lowest average is Middle-level administrators clearly identify the current development status of university education information, This is because clearly identify the current development status of university education information is a time-consuming and labor-intensive thing that requires middle administrators to make long-term learning plans. It is necessary to continuously invest in the investigation in order to ensure the effectiveness of learning and mastering the accurate development status of universities. Related to the viewpoint of Wu da wei (2013,p.25) , it is the basic demand of college information for middle administrators to accurately grasp the current situation of college information development and professional development. universities should pay attention to the long-term development of information leadership of middle administrators, pay attention to growth and learning, and fully mobilize the enthusiasm of middle administrators and stimulate their learning potential by establishing a sustainable investigation system.

**5. Organizational atmosphere** was at high level. This is because universities in Zhejiang are highly attractive to middle administrators compared with universities in central or western China. Therefore, Zhejiang universities need to continue to adopt

diversified information leadership mode of middle administrators, improve their ability to absorb administrators talents, and then form a good organizational atmosphere. From the results of the questionnaire survey on organizational atmosphere, the highest average value is Middle-level administrators support each other and help subordinates. This is because by helping subordinates, you can establish a strong mode of cooperation with subordinates, which can stimulate the enthusiasm of the whole team. Related to the concept of Huang Xiaobin (2022, p.229) , middle administrators in universities can help and support subordinates, which can not only stimulate the vitality of the team, but also effectively improve the leadership level of middle administrators, so as to achieve mutual promotion. The lowest average is Middle-level administrators implement the people-oriented administrators concept everywhere. This is because universities need to scientifically formulate middle-level administrators' trusted leadership methods according to the changes in the information environment and the actual situation of their own development. Blindly putting people first will make subordinates unable to feel the charisma of leaders in various aspects of information leadership, and will also cause subordinates to fail to fully obey leaders. Related to Lei Chaoyu (2020, p.25) concept, the traditional people-oriented information leadership of middle administrators has been unable to adapt to the development of higher education. In order to improve the competitiveness of universities, it is necessary to adjust the information leadership mode of middle administrators and take information technology as the core to meet the needs of society and the development of universities.

## **Part 2: The model for improving information leadership of middle-level administrators in public universities in Zhejiang.**

The researcher proposed the model for improving information leadership of middle-level administrators in public universities in Zhejiang in five aspects, which contain 32 measures. There are 6 measures for improving information literacy, 7 measures for promoting information vision, 7 measures for enhancing Information construction and management, 6 measures for enhancing information-based evaluation, 6 measures for improving organizational atmosphere. The measures to enhance the information vision and strengthen information construction and management are the most, with seven.

First , it shows that improving information vision and strengthening information construction and management are inevitable requirements for college administrators, and college administrators attach great importance to them. Secondly, it shows that enhancing information vision and strengthening information construction and management can have more development and development, and it is highly operable and has great development potential. Finally, improving information vision, strengthening information construction and management is also an inevitable requirement to adapt to the development of The Times and promote the modernization of education. In conclusion, this study is consistent with the views of James Kouzes (2014,p.255) . The enhancement of information vision and the strengthening of information construction and management by university administrators have a profound impact on promoting educational innovation, improving educational quality, promoting educational equity and enhancing the competitiveness of universities.

#### **1. Improving information literacy: Enhance the awareness of information responsibility and enhance information literacy.**

Peter F. Drucker (1996, p.8) noted, "Leadership is not about title, position, privilege, or money, but about responsibility and commitment." Having the sense of responsibility and responsibility is not only the basic premise of individual personality, but also the basic guarantee of social stability and organizational development. In a group, the ability of a leader may vary, but the most basic requirement is to have a sense of responsibility as a leader. Only by taking the initiative to take responsibility, conscientiously fulfilling responsibility, and fully responsible can leaders consciously bring their personal potential into full play. In today's information-based society, the division of labor in society has endowed universities with the attribute of responsibility for personnel training. Universities have become sacred halls of knowledge dissemination and education under information-based conditions, carrying the functional attribute of promoting national prosperity, social development, family harmony, and personal growth and talent. As the leader of university information development and construction, middle administrators must clearly understand the glorious mission they shoulder, strengthen their sense of responsibility and stimulate

the spirit of responsibility from the perspective of historical development and social progress, and enhance their information leadership level by constantly strengthening the character of responsibility, so as to promote the healthy and sustainable development of university information construction. First, we will enhance our sense of responsibility for IT application in history.

Middle administrators in a job to administrators the university for at least three years, five years, more than 10 years. Although such a time span is short for the national implementation of talent strategy and the long history of university development, it is crucial for the development of universities at this stage, especially for the current information construction work. When the baton leading the development of university information is passed to the hand, middle administrators should be clearly aware of the glorious mission given by history and The Times, and clearly realize that they are a very important part of the development chain of university information. Second, we will enhance our sense of social responsibility. As the leader of university information construction, middle administrators should deeply realize the significance of the cultivation of students' information quality for students' growth, social development and national construction, take the initiative to meet the needs of society, and grasp the responsibility of cultivating information-oriented talents in their hands, shoulders and hearts. We must stand at the height of the country and society to fulfill the glorious mission of training information talents for the country and society. In addition, the great advantage of education information is that it can break noted the limitations of time and space, and realize the sharing of high-quality resources between university, regions and even regions by optimizing the allocation of resources, so as to promote the fair, just and balanced development of education. As a middle administrators, we should make full use of the distinctive characteristics of educational information, and give full play to the role of demonstration and radiation on the basis of improving our own information leadership level. By strengthening the construction of information resources in their own universities, deepening the development of information technology in universities, increasing the sharing of high-quality education and teaching resources, and maximizing the drive of brother universities to go together and go in undivided steps. We will ensure that weak

universities are not weak and quality universities are of better quality, and promote the overall improvement and comprehensive development of the education level of the whole society.

## **2. Promoting information vision: establish a common vision and adjust the vision in time**

James Kouzes (2014, p.244) and others point, the success of a leader lies in describing the vision of the team in vivid language and highly infectious way, and igniting the passion of the team to pursue the vision. In university, it is a practical art for middle administrators to carry out information vision encouragement. Only by fully mobilizing the enthusiasm of teachers can middle administrators successfully achieve the established goal of information construction.

First, brainstorm ideas to build a common vision. It is not only the job responsibility of middle administrators, but also one of the important contents of middle administrators' information leadership to formulate the vision of university information. The development of the information vision of the university can not be completed by the middle administrators alone, but requires the collective wisdom and strength of all staff. It is not difficult to understand that if the personal demands and interests of the majority of faculty and staff are consistent with the connotation of the university education information vision planning, their enthusiasm and initiative will be fully mobilized, otherwise, it will cause a certain degree of dissatisfaction or even resistance. Second, do a good job of maintaining and developing the vision, so that the vision of information technology is sustainable and effective. Second, do a good job of maintaining and developing the vision, so that the vision of information technology continues to be effective. After three to five years, middle administrators should evaluate the situation and make timely changes or reinterpretations of the vision of information according to the development of information technology and university construction, and lead the majority of teachers to revise and improve the vision of information.



### **3. Enhancing Information construction and management: optimize resource allocation and strengthen coordination**

The construction and administrators of information resources for middle administrators is the core work for middle administrators to lead the university information construction. If this work is not deep and detailed enough, the university Information construction and management will be like "water without a source, a tree without roots", which is difficult to be implemented.

First, resource integration and optimization, effective integration of information resources inside and outside the university, including hardware facilities, software platforms, digital education resources, etc, to build an open and shared resource system. At the same time, noted data analysis to optimize the allocation of resources, improve the efficiency and benefit of resource use. The second is to promote cross-departmental collaboration, strengthen communication and cooperation between educational administration, scientific research, information technology and other departments, form a collaborative working mechanism, and jointly promote the planning, implementation and evaluation of information projects. Third, draw on external experience and cooperation, actively study successful cases of information construction in domestic and foreign universities, participate in educational information exchange and cooperation projects, introduce advanced concepts and technologies, and promote the rapid improvement of capabilities.

### **4. Enhancing information-based evaluation: Be able to make periodic information evaluation, and lead teachers and students to do a good job of information construction evaluation and feedback on a regular basis**

The promotion of university information evaluation is not only an important part of information construction, but also an important embodiment of the information leadership of middle administrators. If the middle administrators have a good ability to promote information evaluation, they can make information evaluation on a regular basis, lead teachers and students to do a good job in the evaluation and feedback of information construction on a regular basis, and find problems in time. By summarizing experiences and lessons, they can ensure that the university information construction in the future will not take detments.

Middle administrators formulated detailed and detailed "Medium and Long-term Vision Plan for University information Construction". According to the detailed evaluation index system of planning and design, it is specifically divided into the evaluation of people, that is, the evaluation of information team construction and information literacy of teachers and students; The evaluation of the system, that is, the evaluation of the university information construction rules and regulations; The evaluation of resource construction, that is, the stratified analysis of the university hardware and software construction, the use of construction funds and the input and output. The university information construction has made great progress, the hardware infrastructure is becoming more and more perfect, the construction of digital soft environment has achieved leapfrog development, the ability of information technology to support teaching, administrators and learning is gradually enhanced, the majority of faculty and staff have a stronger awareness of information technology, learning and research information technology and application of information technology, and the information atmosphere is also stronger.

**5. Promoting introduction modes and procedures: Build a smooth mechanism to help subordinates and create a good organizational atmosphere.**

This research finds that we can interpret it as: the better the organizational atmosphere of middle administrators' university, the more conducive it is to the generation, promotion and maintenance of middle administrators' information-based leadership. Although the organizational atmosphere can not be seen or touched, it is real. There are many university personnel and many interest groups involved in information construction, so contradictions and conflicts are inevitable. Therefore, it is very important to create a good organizational atmosphere. By creating an organizational atmosphere of mutual trust, mutual understanding and mutual concern, middle administrators can not only mobilize the enthusiasm of the majority of faculty and staff, stimulate everyone's enthusiasm for work, but also facilitate the decision deployment and implementation of information construction work. Building a smooth communication mechanism As a middle administrators, in the process of information construction, it is necessary to build a smooth mechanism to help subordinates and create a good organizational atmosphere.

### **Part 3: The suitability and feasibility of model for improving information leadership of middle-level administrators in public universities in Zhejiang.**

The researcher invites 9 experts to evaluate the model for improving information leadership of middle-level administrators. The researchers invited 9 experts to evaluate the model for improving the effectiveness of information leadership for middle administrators. All 9 experts have more than 5 years of senior administrators work experience in public universities, have rich information leadership experience, doctoral degree or above, and associate professor or above. The data interpretation for mean based on Rensis Likert (1932), the suitability and feasibility of model for improving information leadership of middle-level administrators in five aspects were at highest or high level, which means the model for improving information leadership of middle-level administrators are suitability and feasibility.

The suitability of model for improving information leadership of middle-level administrators in high level, the highest mean enhancing information construction and management. Improving information literacy of middle-level administrators in highest mean, the highest mean culcate information ethics and social responsibility. Promoting information vision of middle-level administrators in high mean, the highest mean strengthen the training of information talents. Enhancing information construction and management of middle-level administrators in high mean, the highest mean promote technological innovation. Enhancing information-based evaluation of middle-level administrators in high mean, the highest mean to clarify the evaluation index system. Improving organizational atmosphere of middle-level administrators in high mean, the highest mean establish a cross-departmental collaboration mechanism. Which means that: First, there is a clear demand for and emphasis on improving the information leadership ability of middle managers at the top mean. Leaders at the highest mean recognize this and are committed to promoting the information construction and management of the entire organization to ensure that the organization remains competitive in the information age. Such promotion not only helps middle managers to better perform their duties, but also helps middle managers to better perform their duties. It can also make higher-ups trust and rely more on their decisions. Second,

information construction and management are essential for modern organizations, and they want to enhance these capabilities noted training and education. From the middle management to the top mean, technological innovation is actively promoted. The high-level administrators recognizes the importance of technological innovation to the development of the organization, and hopes to enhance the overall competitiveness of the organization noted such promotion. At the same time, it should strengthen the information-based evaluation of senior and middle managers, clarify the high-level evaluation index system can better measure the performance of middle managers in information leadership, establish or improve a set of evaluation system in order to more accurately evaluate their performance, and provide feedback and improvement direction. Third, high-level administrators recognizes that a good organizational climate is critical to motivating middle managers to be motivated and innovative, and they are taking steps to create and sustain it. At the same time, cross-sectoral collaboration mechanisms are being promoted at the highest mean. This not only helps to improve the work efficiency and effectiveness of middle managers, but also helps to enhance the overall competitiveness of the organization. In conclusion, these descriptions are generally consistent with the views of Peterson, Seligman (2001, p.63), and Liu Jinzhi (1985, p.666) .The high-level administrators is comprehensively and stratifiedally improving the ability and quality of the middle management in information leadership, information construction and management, technological innovation and cross-departmental collaboration to ensure that the organization remains competitive and achieves sustainable development in the information age.

The feasibility of model for improving information leadership of middle-level administrators in high level, the highest mean enhancing information construction and management. Improving information literacy of middle-level administrators in highest mean, the highest mean culcate information ethics and social responsibility. Promoting information vision of middle-level administrators in highest mean, the highest mean strengthen the training of information talents. Enhancing information construction and management of middle-level administrators in high mean, the highest mean promote technological innovation. Enhancing information-based evaluation of middle-level administrators in highest mean, the highest mean introduce third-party evaluation

agencies. Improving organizational atmosphere of middle-level administrators in highest mean. the highest mean establish a cross-departmental collaboration mechanism. Which means that: First, in the digital era, as the key link between strategic decision-making and front-line implementation, middle managers' information leadership is crucial to the organization's information transformation. Strengthening information construction and management can ensure the consistency of information strategy and the overall goal of the organization. At the same time, the goal, path and assessment mechanism of information construction are clearly defined to ensure the effective allocation of resources and the smooth implementation of projects. Second, emphasizing information literacy and ethics not only helps to create a positive culture, but also enhances the credibility of colleges and universities. Encouraging middle managers to participate in industry exchanges, international conferences, etc, can help them get the latest industry dynamics and technology trends, and broaden their international horizons. At the same time, the establishment of internal personnel training system is conducive to the exploration and training of information technology talents with innovative thinking and cross-border ability, and reserves forces for the sustainable development of the university. Third. noted the top-down encouragement mechanism, middle managers can be motivated to lead the team to carry out technological innovation and process optimization. Increasing the objectivity and impartiality of the evaluation can help universities to more accurately identify the effectiveness and shortcomings of information construction. At the same time, the establishment of inter-departmental collaboration mechanisms to break down information silos will help promote resource sharing and collaborative innovation In conclusion, the feasibility of this series of models is basically consistent with the views of John Antonakis (2015,p.200) and Sun Zhenxiang (2016, p.66) .The reason is that they stratifiedally cover multiple dimensions of information construction, from the improvement of personnel ability to the optimization of organizational structure, and then to the creation of cultural atmosphere, forming an overall framework of mutual support and collaborative promotion.

## Recommendations

### Implications

**1. Strengthen information literacy training.** First of all, according to the specific needs of middle administrators, regular information technology training courses are organized, covering the latest information technology applications, data analysis tools, cloud computing, artificial intelligence and other cutting-edge technologies. At the same time, combined with educational administrators and leadership theory, to cultivate administrators' decision-making ability, problem solving ability and innovative thinking in the information environment. noted stratified learning, administrators can understand how technology affects teaching, research and administrators processes, so that they can better use technology to promote the development of universities.

**2. Implement the information leadership Vision development project.** Establish special information leadership vision development projects, such as leadership workshops, seminars or workshops, invite industry experts, successful case sharing and practical and experienced mentors inside and outside the university, noted case analysis, role playing, simulation and other forms, so that administrators can learn how to use information technology in practical work to improve administrators effectiveness. How to lead teams to adapt to digital transformation. This experiential learning deepens understanding, stimulates innovative thinking, and promotes a deep integration of theory and practice.

**3. Promote information-based project administrators practice.** Encourage and support middle administrators to personally participate in or information leadership, such as teaching administrators system upgrade, scientific research data platform construction, smart campus planning, etc. noted the whole process of project administrators practice, they can learn the complete methodology of project planning, execution, monitoring and evaluation, master how to effectively integrate resources, administrators risks, and promote cross-departmental collaboration. The problems and solutions encountered in practice will become valuable practical experience and lay a solid foundation for facing more complex information challenges in the future.

**4. Introduce information-based leadership performance evaluation mechanism.** Take information-based leadership as an important part of the performance evaluation of middle administrators, and design a scientific and reasonable evaluation index system, such as the application ability of information technology, the promotion effect of digital transformation, and the improvement of team information literacy. noted regular self-assessment, superior evaluation, colleague feedback and subordinate opinion collection, the performance of administrators in information leadership is comprehensively and objectively measured. Based on the evaluation results, develop personalized growth plans, provide necessary support and resources, and encourage administrators to continuously improve their information-based leadership. At the same time, the evaluation results are linked to career development, rewards and incentives to form a positive cycle and promote the continuous progress of information leadership of the entire administrators team.

**5. Establish a good information organizational atmosphere.** Build an open and interactive information exchange organizational atmosphere, such as internal forums, online communities or regular information salons, encourage administrators to share the experience, challenges and achievements of information construction, and promote the free flow of information, resources and ideas. Such an organizational atmosphere can not only enhance communication and collaboration between teams, but also promote information symmetry between different departments and form a good information ecological environment. At the same time, by inviting external experts to conduct online lectures or exchanges, administrators can broaden their horizons and absorb external advanced experience.

## Future Researches

1. In this research, 5 universities in Zhejiang as samples to conduct a questionnaire survey on the information leadership status of middle administrators in Zhejiang universities. The amount of micro-data collection is small and does not involve higher vocational colleges, so it is impossible to fully understand the overall status quo of information leadership of middle administrators in Zhejiang universities. Therefore, in future research, the scope of research can be expanded to conduct more detailed research on different types and levels of universities.

2. Based on the former study, researchers analyzed five key variables that improve the effectiveness of information leadership of middle administrators in universities. Future studies can continue to explore more variables of information leadership of middle administrators in universities on the basis of other theories to conduct more comprehensive verification.

3. From the perspective of middle administrators, this study mainly adopts literature analysis, questionnaire survey and structured interview methods. On this basis, future research can be carried out. Researchers can study the current situation of information leadership of middle administrators in Zhejiang universities and its influencing factors from other perspectives, adopt questionnaire survey to investigate the situation of information leadership of middle administrators in Zhejiang universities, and use mathematical statistics to test the model of influencing factors. noted more empirical research, we can put forward more targeted suggestions for improving the effectiveness of information leadership of middle administrators in Zhejiang universities.

4. The research on the effectiveness of information leadership of middle administrators involves many disciplines such as education, administrators, economics, behavior and sociology. In the future research, interdisciplinary research teams can be organized to conduct more comprehensive and in-depth research by combining their respective advantages, and put forward more information leadership opinions and suggestions that not only meet the development goals of universities but also meet the individual needs of middle administrators.



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## Appendix

## Appendix A

### List of Specialists and Letters of Specialists Invitation for IOC Verification

### Specialists for IOC Verification

No	Name	Professional title	Personal Introduction
1	Ye Huasong	Professor	Degree: Ph.D. Work place: Lishui University
2	Wang Jiu	Professor	Degree: Ph.D. Work place: Lishui University
3	Peng Bing	Professor	Degree: Ph.D. Work place: Lishui University
4	Lu Jianwei	Professor	Degree: Ph.D. Work place: Lishui University
5	Zhang Long	Professor	Degree: Ph.D. Work place: Lishui University



Ref.No. MHESI 0643.14/421

Bansomdejchaopraya Rajabhat University  
1061 Itsaraparb Hirunrujee  
Thonburi Bangkok 10600

22 January 2024

RE: Invitation to validate research instrument

Dear Professor Dr. Ye Huasong, Lishui University

Mr.Zhang Wenming is a graduate student in Doctor of Philosophy Program in Educational Administration of Bansomdejchaopraya Rajabhat University. He is undertaking research entitle “Model for Improving the Information leadership of Middle-level Administrators in New Era of Public Universities in Zhejiang Province”

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

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

Sincerely,

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

Bansomdejchaopraya Rajabhat University  
Tel.+662-473-7000  
[www.bsru.ac.th](http://www.bsru.ac.th)  
E-mail: [grad@bsru.ac.th](mailto:grad@bsru.ac.th)





Ref.No. MHESI 0643.14/422

Bansomdejchaopraya Rajabhat University  
1061 Itsaraparb Hirunrujee  
Thonburi Bangkok 10600

22 January 2024

RE: Invitation to validate research instrument

Dear Professor Dr. Wang Jiu, Lishui University

Mr.Zhang Wenming is a graduate student in Doctor of Philosophy Program in Educational Administration of Bansomdejchaopraya Rajabhat University. He is undertaking research entitle “Model for Improving the Information leadership of Middle-level Administrators in New Era of Public Universities in Zhejiang Province”

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Sincerely,

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Dean of Graduate School

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[www.bsru.ac.th](http://www.bsru.ac.th)  
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Ref.No. MHESI 0643.14/424

Bansomdejchaopraya Rajabhat University  
1061 Itsaraparb Hirunrujee  
Thonburi Bangkok 10600

22 January 2024

RE: Invitation to validate research instrument

Dear Professor Dr. Lu Jianwei, Lishui University

Mr.Zhang Wenming is a graduate student in Doctor of Philosophy Program in Educational Administration of Bansomdejchaopraya Rajabhat University. He is undertaking research entitle “Model for Improving the Information leadership of Middle-level Administrators in New Era of Public Universities in Zhejiang Province”

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[www.bsru.ac.th](http://www.bsru.ac.th)  
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Ref.No. MHESI 0643.14/425

Bansomdejchaopraya Rajabhat University  
1061 Itsaraparb Hirunrujee  
Thonburi Bangkok 10600

22 January 2024

RE: Invitation to validate research instrument

Dear Professor Dr. Zhang Long, Lishui University

Mr.Zhang Wenming is a graduate student in Doctor of Philosophy Program in Educational Administration of Bansomdejchaopraya Rajabhat University. He is undertaking research entitle “Model for Improving the Information leadership of Middle-level Administrators in New Era of Public Universities in Zhejiang Province”

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Ref.No. MHESI 0643.14/423

Bansomdejchaopraya Rajabhat University  
1061 Itsaraparb Hirunrujee  
Thonburi Bangkok 10600

22 January 2024

RE: Invitation to validate research instrument

Dear Professor Dr. Peng Bing, Lishui University

Mr.Zhang Wenming is a graduate student in Doctor of Philosophy Program in Educational Administration of Bansomdejchaopraya Rajabhat University. He is undertaking research entitle “Model for Improving the Information leadership of Middle-level Administrators in New Era of Public Universities in Zhejiang Province”

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[www.bsru.ac.th](http://www.bsru.ac.th)  
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Appendix B  
Official Letter



Ref.No. MHESI 0643.14/426

Bansomdejchaopraya Rajabhat University  
1061 Itsaraparb Hirunrujee  
Thonburi Bangkok 10600

22 January 2024

RE: Request for Data Collection

Dear Lishui University

Mr.Zhang Wenming is a graduate student in Doctor of Philosophy Program in Educational Administration of Bansomdejchaopraya Rajabhat University. He is undertaking research entitle “Model for Improving the Information leadership of Middle-level Administrators in New Era of Public Universities in Zhejiang Province”

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

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

Sincerely,

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

Bansomdejchaopraya Rajabhat University  
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[www.bsru.ac.th](http://www.bsru.ac.th)  
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Ref.No. MHESI 0643.14/427

Bansomdejchaopraya Rajabhat University  
1061 Itsaraparb Hirunrujee  
Thonburi Bangkok 10600

22 January 2024

RE: Request for Data Collection

Dear Zhejiang A & F University

Mr.Zhang Wenming is a graduate student in Doctor of Philosophy Program in Educational Administration of Bansomdejchaopraya Rajabhat University. He is undertaking research entitle “Model for Improving the Information leadership of Middle-level Administrators in New Era of Public Universities in Zhejiang Province”

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

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Sincerely,

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Dean of Graduate School

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[www.bsru.ac.th](http://www.bsru.ac.th)  
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Ref.No. MHESI 0643.14/428

Bansomdejchaopraya Rajabhat University  
1061 Itsaraparb Hirunrujee  
Thonburi Bangkok 10600

22 January 2024

RE: Request for Data Collection

Dear Zhejiang Ocean University

Mr.Zhang Wenming is a graduate student in Doctor of Philosophy Program in Educational Administration of Bansomdejchaopraya Rajabhat University. He is undertaking research entitle “Model for Improving the Information leadership of Middle-level Administrators in New Era of Public Universities in Zhejiang Province”

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

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

Sincerely,

A handwritten signature in blue ink, appearing to be 'K' followed by a stylized flourish.

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

Bansomdejchaopraya Rajabhat University  
Tel.+662-473-7000  
[www.bsru.ac.th](http://www.bsru.ac.th)  
E-mail: grad@bsru.ac.th





Ref.No. MHESI 0643.14/429

Bansomdejchaopraya Rajabhat University  
1061 Itsaraparb Hirunrujee  
Thonburi Bangkok 10600

22 January 2024

RE: Request for Data Collection

Dear Zhejiang Normal University

Mr.Zhang Wenming is a graduate student in Doctor of Philosophy Program in Educational Administration of Bansomdejchaopraya Rajabhat University. He is undertaking research entitle “Model for Improving the Information leadership of Middle-level Administrators in New Era of Public Universities in Zhejiang Province”

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

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

Sincerely,

(Assistant Professor Dr.Kanakorn Sawangcharoen)  
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Ref.No. MHESI 0643.14/430

Bansomdejchaopraya Rajabhat University  
1061 Itsaraparb Hirunrujee  
Thonburi Bangkok 10600

22 January 2024

RE: Request for Data Collection

Dear Wenzhou University

Mr.Zhang Wenming is a graduate student in Doctor of Philosophy Program in Educational Administration of Bansomdejchaopraya Rajabhat University. He is undertaking research entitle “Model for Improving the Information leadership of Middle-level Administrators in New Era of Public Universities in Zhejiang Province”

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

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Sincerely,

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[www.bsru.ac.th](http://www.bsru.ac.th)  
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Ref.No. MHESI 0643.14/431

Bansomdejchaopraya Rajabhat University  
1061 Itsaraparb Hirunrujee  
Thonburi Bangkok 10600

22 January 2024

RE: Invitation to Evaluate the Model

Dear Professor Dr. Liao feng, Lishui University

Mr.Zhang Wenming is a graduate student in Doctor of Philosophy Program in Educational Administration of Bansomdejchaopraya Rajabhat University. He is undertaking research entitle “Model for Improving the Information leadership of Middle-level Administrators in New Era of Public Universities in Zhejiang Province”

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

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

Sincerely,

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Ref.No. MHESI 0643.14/432

Bansomdejchaopraya Rajabhat University  
1061 Itsaraparb Hirunrujee  
Thonburi Bangkok 10600

22 January 2024

RE: Invitation to Evaluate the Model

Dear Professor Dr. Zhao Weichuan, Lishui University

Mr.Zhang Wenming is a graduate student in Doctor of Philosophy Program in Educational Administration of Bansomdejchaopraya Rajabhat University. He is undertaking research entitle “Model for Improving the Information leadership of Middle-level Administrators in New Era of Public Universities in Zhejiang Province”

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Ref.No. MHESI 0643.14/433

Bansomdejchaopraya Rajabhat University  
1061 Itsaraparb Hirunrujee  
Thonburi Bangkok 10600

22 January 2024

RE: Invitation to Evaluate the Model

Dear Professor Dr. Chen Yi, Lishui University

Mr.Zhang Wenming is a graduate student in Doctor of Philosophy Program in Educational Administration of Bansomdejchaopraya Rajabhat University. He is undertaking research entitle “Model for Improving the Information leadership of Middle-level Administrators in New Era of Public Universities in Zhejiang Province”

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E-mail: [grad@bsru.ac.th](mailto:grad@bsru.ac.th)



Ref.No. MHESI 0643.14/434

Bansomdejchaopraya Rajabhat University  
1061 Itsaraparb Hirunrujee  
Thonburi Bangkok 10600

22 January 2024

RE: Invitation to Evaluate the Model

Dear Professor Dr. Xu Li, Lishui University

Mr.Zhang Wenming is a graduate student in Doctor of Philosophy Program in Educational Administration of Bansomdejchaopraya Rajabhat University. He is undertaking research entitle “Model for Improving the Information leadership of Middle-level Administrators in New Era of Public Universities in Zhejiang Province”

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Bansomdejchaopraya Rajabhat University  
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Ref.No. MHESI 0643.14/435

Bansomdejchaopraya Rajabhat University  
1061 Itsaraparb Hirunrujee  
Thonburi Bangkok 10600

22 January 2024

RE: Invitation to Evaluate the Model

Dear Professor Dr. Wei Li, Lishui University

Mr.Zhang Wenming is a graduate student in Doctor of Philosophy Program in Educational Administration of Bansomdejchaopraya Rajabhat University. He is undertaking research entitle “Model for Improving the Information leadership of Middle-level Administrators in New Era of Public Universities in Zhejiang Province”

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Ref.No. MHESI 0643.14/436

Bansomdejchaopraya Rajabhat University  
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Thonburi Bangkok 10600

22 January 2024

RE: Invitation to Evaluate the Model

Dear Professor Dr. Shao Weiwei, Lishui University

Mr.Zhang Wenming is a graduate student in Doctor of Philosophy Program in Educational Administration of Bansomdejchaopraya Rajabhat University. He is undertaking research entitle “Model for Improving the Information leadership of Middle-level Administrators in New Era of Public Universities in Zhejiang Province”

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

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

Sincerely,

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

Bansomdejchaopraya Rajabhat University  
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Ref.No. MHESI 0643.14/437

Bansomdejchaopraya Rajabhat University  
1061 Itsaraparb Hirunrujee  
Thonburi Bangkok 10600

22 January 2024

RE: Invitation to Evaluate the Model

Dear Professor Dr. Wang Falong, Lishui University

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22 January 2024

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Dear Professor Dr. Wang Jiupeng, Lishui University

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22 January 2024

RE: Invitation to Evaluate the Model

Dear Professor Dr. Feng Hongyan, Lishui University

Mr.Zhang Wenming is a graduate student in Doctor of Philosophy Program in Educational Administration of Bansomdejchaopraya Rajabhat University. He is undertaking research entitle “Model for Improving the Information leadership of Middle-level Administrators in New Era of Public Universities in Zhejiang Province”

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## Appendix C

### Research Instruments

## Questionnaire

**Title: Model for improving the information leadership of middle-level administrators in public universities in Zhejiang**

### Explanation

1. This questionnaire is about model for improving the information leadership of middle-level administrators in public universities in Zhejiang. The objectives of this research were to study the current situation of information leadership of middle-level administrators in public universities in Zhejiang, to propose the model for improving the information leadership of middle-level administrators in public universities in Zhejiang, and to evaluate the suitability and feasibility of model for improving the information leadership of middle-level administrators in public universities in Zhejiang.

2. The questionnaire about model for improving the information leadership of middle-level administrators in public universities in Zhejiang, which provided into two parts. Part one is personal information of respondents and part two is survey about the current situation of information leadership of middle-level administrators in public universities in Zhejiang, total 61 questions.

3. Please tick ✓ in the columns that represent your opinion about the information leadership of middle-level administrators in public universities in Zhejiang.

Thank you

Mr. Zhang Wenming

A doctoral student in Educational administration program

Bansomdejchaopraya Rajabhat University

**Part 1: Identity of Interviewee (Personal Information)****1 Gender:**☐ Male☐ Female**2. Age:**☐ 30 years old and under☐ 31-35 years old☐ 36-40 years old☐ 41-45 years old☐ 46-50 years old☐ 51 years old and older**3. Education level:**☐ Bachelor degree or below☐ Postgraduate☐ Doctoral candidate**4. Professional title:**☐ Teaching assistant☐ The lecturer or Assistant Professor☐ Associate professor☐ Professor**5. Years of middle-level manager:**☐ 5 years or less☐ 6 to 10 years☐ 11 to 15 years☐ 16-20 years☐ 20 years and above

**Part 2:** Survey about the current situation of information leadership of middle-level administrators in public universities in Zhejiang.

5 express the level of information leadership of middle-level administrators at highest level

4 express the level of information leadership of middle-level administrators at high level

3 express the level of information leadership of middle-level administrators at medium level

2 express the level of information leadership of middle-level administrators at low level

1 express the level of information leadership of middle-level administrators at lowest level

No	The current situation of information leadership of middle-level administrators in public universities in Zhejiang	5	4	3	2	1
<b>Information literacy (The first variable)</b>						
1	Middle-level administrators have the concept of lifelong learning and development					
2	Middle-level administrators have a strong sense of information responsibility					
3	Middle-level administrators have a strong level of information technology					
4	Middle-level administrators have strong technical application ability					
5	Middle-level administrators understand the ethics related to information technology					

No	The current situation of information leadership of middle-level administrators in public universities in Zhejiang	5	4	3	2	1
6	Middle-level administrators understand the laws and regulations related to information technology					
7	Middle-level administrators consciously learn knowledge related to education information					
8	Middle-level administrators skillfully use information technology to obtain network resources.					
9	Middle-level administrators recognize the latest development trend of educational information					
10	Middle-level administrators learn education information policies in effective manner					
11	Middle-level administrators have the drive to tackle difficulties head-on					
12	Middle-level administrators be more interested in emerging information technology					



No	The current situation of information leadership of middle-level administrators in public universities in Zhejiang	5	4	3	2	1
<b>Information Vision (The second variable)</b>						
1	Middle-level administrators help the principal establish an information vision that is recognized by all members of the university					
2	Middle-level administrators often organize information vision exchange activities					
3	Middle-level administrators actively promote new information technology to the university and promote reform during the formulation of vision planning					
4	Middle-level administrators make information vision					
5	Middle-level administrators lead the formulation of the department's long-range, medium and near-term information vision planning					
6	Middle-level administrators lead the formulation of the vision of the university information management system					
7	Middle-level administrators lead the formulation of the vision for the construction of information infrastructure					
8	Middle-level administrators to lead the formulation of university information fund use planning vision					

No	The current situation of information leadership of middle-level administrators in public universities in Zhejiang	5	4	3	2	1
9	Middle-level administrators interpret the university information vision plan to teachers and students on different occasions					
10	Middle-level administrators combine talent training planning, information technology application planning and other planning with policies and regulations in information construction					
11	Middle-level administrators make timely adjustments to information vision planning in the process of construction					

No	The current situation of information leadership of middle-level administrators in public universities in Zhejiang	5	4	3	2	1
Information construction and management (The third variable)						
1	Middle-level administrators working of the university information infrastructure is relatively perfect					
2	Middle-level administrators to provide quality information resources to the whole university is their responsibility					
3	Middle-level administrators working of the university has special departments and personnel to manage the university information work is conducive to improving the university information level					
4	Middle-level administrators lead the construction of university information-based teaching resources					
5	Middle-level administrators actively participate in the construction of information resource platform for teachers' teaching application					
6	Middle-level administrators have taken the initiative to participate in higher-level					

No	The current situation of information leadership of middle-level administrators in public universities in Zhejiang	5	4	3	2	1
	university information construction planning					
7	Middle-level administrators provide support for information construction in terms of system and fund planning					
8	Middle-level administrators build a mechanism to improve the information level of teachers and students					
9	Middle-level administrators actively promote teachers to implement information-based classroom teaching					
10	Middle-level administrators support the use of information management methods in personnel, finance and asset management of the university					
11	Middle-level administrators provide rich information teaching resources for teachers and students to download and use					
12	Middle-level administrators reasonably allocate funds, human resources and teaching resources to ensure the completion and continuous					

No	The current situation of information leadership of middle-level administrators in public universities in Zhejiang	5	4	3	2	1
	implementation of information construction planning					
13	Middle-level administrators effectively implement, manage, supervise and plan the work content related to information technology					

No	The current situation of information leadership of middle-level administrators in public universities in Zhejiang	5	4	3	2	1
Information-based evaluation (The fourth variable)						
1	Middle-level administrators develop a clear information resource evaluation system					
2	Middle-level administrators often use information methods for management or evaluation					
3	Middle-level administrators consider information technology ability as a factor for human resource management					
4	Middle-level administrators mastery of information technology is an important factor in evaluating educational					
5	Middle-level administrators regularly organize the evaluation of the university's information vision planning and implementation					
6	Middle-level administrators regularly organize the assessment of the university's information teaching					
7	Middle-level administrators regularly organize the assessment of the construction of information resources in the university					
8	Middle-level administrators regularly organize the assessment of the use of university					

No	The current situation of information leadership of middle-level administrators in public universities in Zhejiang	5	4	3	2	1
	information funds					
9	Middle-level administrators clearly identify the current development status of university education information					
10	Middle-level administrators evaluate the university's information-based teaching environment					
11	Middle-level administrators supervise the implementation of the university information plan					
12	Middle-level administrators put forward corresponding suggestions on the improvement of information planning according to the implementation of the plan					

No	The current situation of information leadership of middle-level administrators in public universities in Zhejiang	5	4	3	2	1
<b>Organizational atmosphere (The fifth variable)</b>						
1	Middle-level administrators help the principal to set up the university information management team and ensure the orderly progress of the university information construction and planning					
2	Middle-level administrators guide all members of the university to create a good information campus culture					
3	Middle-level administrators implement the people-oriented management concept					
4	Middle-level administrators maintain a friendly atmosphere between people					
5	Middle-level administrators support each other					
6	Middle-level administrators share their experience and skills with their subordinates					
7	Middle-level administrators encourage their subordinates to speak out different ideas					
8	Middle-level administrators provide regular information training for subordinates					
9	Middle-level administrators often communicate and discuss problems in work					



No	The current situation of information leadership of middle-level administrators in public universities in Zhejiang	5	4	3	2	1
	with their subordinates					
10	Middle-level administrators actively listen to the feedback of employees and students on information management					
11	Middle-level administrators actively feed back to the principal the problems existing in the information construction of the university					
12	Middle-level administrators take the initiative to use the network platform to communicate with other university and share their experience					
13	Middle-level administrators take the initiative to use information methods to search data in the management process and use big data to analyze problems					

## Structured Interview

### Model for improving information leadership of middle-level administrators in public universities in Zhejiang

This Structured Interview is divided into two parts:

**Part 1:** Personal Information

**Part 2:** The current situation of information leadership of middle-level administrators  
in public universities in Zhejiang

**Part 1:** Personal Information

Interviewee \_\_\_\_\_ Interview Date \_\_\_\_\_ Interview Time \_\_\_\_\_

Gender \_\_\_\_\_ Education background \_\_\_\_\_

Academic title \_\_\_\_\_ Work place \_\_\_\_\_ Work experience \_\_\_\_\_

**Part 2:** The current situation of information leadership of middle-level administrators  
in public universities in Zhejiang

**Instruction:** please provide your opinion on the following statement

1. How to enhance the sense of information responsibility? In addition, do you have any suggestions for the information literacy of public universities?

2. How should middle management leaders develop the department's long-range, medium and near-term information vision planning? In addition, do you have any suggestions for the information vision?

3. How should middle administrators rationally allocate funds, human resources and teaching resources to ensure the completion and continuous implementation of information construction planning? In addition, do you have any suggestions for the information construction and management?

4. How can middle administrators organize regular evaluations of the university's information vision planning and implementation? In addition, do you have any suggestions for the information-based evaluation?

5. How do middle administrators support and help their subordinates? In addition, do you have any suggestions for the organizational atmosphere?

### Interview content

**Question 1:** How to enhance the sense of information responsibility? In addition, do you have any suggestions for the information literacy of public universities?

**Interviewee 1:** In the current era of information explosion, college teachers and students are faced with the challenge of information screening, identification and use. In my opinion, we should start from the curriculum and strengthen information literacy education, so that students can have the ability to identify.

**Interviewee 2:** In the field of scientific research, information responsibility is particularly important. We need to guide researchers to observe academic ethics, properly use and cite information, and avoid academic misconduct.

**Interviewee 3:** As the gathering place of information resources, libraries have the responsibility to provide high-quality information services. We can organize information literacy lectures and courses to help students and teachers improve their ability to retrieve, analyze and use information.

**Interviewee 4:** From the perspective of students' work, we can enhance students' sense of information responsibility by holding thematic class meetings and information literacy competitions. At the same time, we should also pay attention to the mental health of students and guide them to face the pressure of Internet information and public opinion correctly.

**Interviewee 5:** In the campus information construction, we can use technical means to improve the security and reliability of information. For example, the establishment of information filtering and review mechanisms to prevent the spread of bad information; Strengthen network security education, improve teachers and students' awareness of network security.

**Interviewee 6:** As a publicity department, we will strictly check the information released to ensure the authenticity and accuracy of information. At the same time, we will also strengthen communication and cooperation with the media to enhance the visibility and influence of the university.

**Interviewee 7:** From a financial point of view, we need to ensure funding for information literacy education. This includes the purchase of information literacy

education related teaching resources, equipment and support for related activities.

**Interviewee 8:** In terms of teacher training, we can incorporate information literacy education into teacher training programs to improve teachers' information literacy level. At the same time, we can also strengthen teachers by introducing teachers with experience in information literacy education.

**Interviewee 9:** In terms of international exchanges, we can learn from the advanced experience of other countries and regions and jointly promote the development of information literacy education.

**Interviewee 10:** As the logistics department, we will ensure the perfection of campus facilities and the quality of services. For example, to provide advanced information retrieval system for libraries, to provide stable network services for teachers and students, etc, to provide a strong material guarantee for information literacy education.

**Question 2:** How should middle management leaders develop the department's long-range, medium and near-term information vision planning? In addition, do you have any suggestions for the information vision?

**Interviewee 1:** In my opinion, first of all, we need to clarify the core responsibilities and development direction of the department, and then set the goals of information vision planning in combination with the overall strategy of the university.

**Interviewee 2:** Information vision planning should pay attention to the collection, sorting and utilization of scientific research data, and strengthen the dissemination and exchange of scientific research information to enhance the influence of scientific research.

**Interviewee 3:** Information vision planning can focus on the integration and utilization of student information, such as the establishment of student information management system to improve management efficiency and service quality.

**Interviewee 4:** Our information vision planning should focus on the flow and sharing of information, ensure the smooth flow of information between departments, and improve work efficiency.

**Interviewee 5:** Our information vision planning should focus on improving the quantity and quality of information resources, strengthening information literacy education, and cultivating students' ability to acquire and use information.

**Interviewee 6:** From the technical point of view, we need to constantly update and improve the information technology facilities according to the objectives of the information vision plan, and provide stable and efficient information technology support for various departments.

**Interviewee 7:** Information vision planning can focus on the integration and utilization of international educational resources, strengthen information exchange and cooperation with international universities, and enhance the international influence of university.

**Interviewee 8:** When formulating the information vision plan, we need to pay attention to the coherence and sustainability of the plan, and ensure that the long, medium and short term goals are linked together to form a complete development blueprint.

**Interviewee 9:** From a financial point of view, we need to reasonably budget funds according to the needs of information vision planning to ensure that the implementation of the plan has sufficient financial support.

**Interviewee 10:** Human resource is the key to implement information vision planning. We need to rationally allocate human resources according to the needs of the plan, and strengthen the information literacy training of employees to improve the overall ability of the team.

**Question 3:** How should middle administrators rationally allocate funds, human resources and teaching resources to ensure the completion and continuous implementation of information construction planning? In addition, do you have any suggestions for the information construction and management?

**Interviewee 1:** When middle-level administrators make information construction plans, they must first clarify the demand and distribution of funds. This requires close cooperation with the finance department to ensure the proper investment and effective use of funds.

**Interviewee 2:** Capital is the key to information construction. We need to prioritize IT projects and allocate funds according to their importance and urgency. Establish a supervision mechanism for the use of ensure that funds are not wasted.

**Interviewee 3:** In terms of human resource allocation, middle-level administrators need to reasonably allocate personnel with relevant skills and experience according to the needs of information construction. At the same time, strengthen personnel training and skill upgrading to ensure that the team has the ability to sustainable development.

**Interviewee 4:** In terms of teaching resources, we should make full use of existing resources, such as classrooms and laboratories, and actively introduce new teaching technologies and tools to improve teaching quality and efficiency.

**Interviewee 5:** Provide necessary technical support and solutions to middle-level administrators. We need to ensure the stability and security of campus network to provide a solid foundation for information construction.

**Interviewee 6:** There is also a high demand for information construction in the field of scientific research. We need to provide researchers with advanced research equipment and information systems to support their research work. At the same time, strengthen the sharing and exchange of scientific research data, and improve the level of scientific research.

**Interviewee 7:** When formulating the information construction plan, we need to consider the overall development strategy and goals of the university. middle-level administrators should formulate the goals and plans of information construction according to the long-term planning of the university.

**Interviewee 8:** International cooperation and exchanges are also important aspects of information construction. noted cooperation with international universities, we can introduce advanced information technology and management experience to promote the process of information construction of university.

**Interviewee 9:** I recommend that middle-level administrators pay attention to balance and coordination when allocating resources. To meet the needs of the present, but also to consider the future development. At the same time, strengthen the communication and cooperation between departments, form a joint force.

**Interviewee 10:** middle-level administrators need to comprehensively consider the overall development strategy, financial situation, human resources, technical support and other factors of the university, formulate a scientific and reasonable information construction plan.

**Question 4:** How can middle administrators organize regular evaluations of the university's information vision planning and implementation? In addition, do you have any suggestions for the information-based evaluation?

**Interviewee 1:** When the middle-level administrators organize the evaluation, they should first clarify the purpose and criteria of the evaluation to ensure the pertinence and effectiveness of the evaluation.

**Interviewee 2:** middle-level administrators should pay attention to the evaluation of information system stability, security and user experience. At the same time, it is also very important to collect and analyze the feedback of teachers and students on the information system regularly.

**Interviewee 3:** In the evaluation process, the overall development plan and goal of the university should be fully considered to ensure that the information vision planning is consistent with the strategic direction of the university.

**Interviewee 4:** The use of funds is also an important part of the evaluation. middle-level administrators should pay attention to the capital input and output benefits of information construction to ensure the rational use of funds.

**Interviewee 5:** We should pay attention to the evaluation of the use of the information-based teaching platform, the teaching effect and the satisfaction of teachers and students. This helps us to find and solve the problems in teaching in time.

**Interviewee 6:** The evaluation of information technology in the field of scientific research should focus on the ability to collect, process and analyze scientific research data, as well as the use of scientific research cooperation and exchange platforms.

**Interviewee 7:** Human resource allocation and training are also part of the evaluation, we should pay attention to the utilization efficiency of human resources in the information construction and the effectiveness of training.

**Interviewee 8:** In terms of international cooperation and exchange, we can learn from the advanced experience of other universities to carry out international comparison and evaluation of information construction, so as to continuously improve our information level.

**Interviewee 9:** middle-level administrators should comprehensively consider technology, capital, teaching, research, student services, human resources and international cooperation when organizing regular evaluations. At the same time, I suggest that middle-level administrators strengthen communication and collaboration with other departments, form a joint force, and jointly promote the continuous improvement of the university information vision planning and implementation.

**Interviewee 10:** To improve the quality of evaluation, we can establish a professional evaluation team, introduce third-party evaluation agencies, and adopt scientific methods and tools for evaluation to ensure the objectivity and accuracy of evaluation results. In addition, we should also strengthen the feedback and application of the evaluation results, and take the evaluation results as an important basis for improving information construction and optimizing resource allocation.

**Question 5:** How do middle administrators support and help their subordinates? In addition, do you have any suggestions for the organizational atmosphere?

**Interviewee 1:** middle-level administrators should provide employees with a good working environment and the necessary resources to support them so that they can fully develop their talents and potential.

**Interviewee 2:** middle-level administrators should encourage employees to actively participate in research projects and provide necessary guidance and training to help them improve their research capabilities and levels.



**Interviewee 3:** middle-level administrators should pay attention to the needs of subordinates, provide them with necessary help and support, and promote communication and cooperation among employees to form a good working atmosphere.

**Interviewee 4:** middle-level administrators should reasonably plan and allocate the budget to ensure the smooth operation of the department. At the same time, they should also pay attention to the welfare of employees and enhance their enthusiasm for work.

**Interviewee 5:** middle-level administrators should pay attention to the career development and training of employees, provide them with diverse learning opportunities, and help them achieve personal growth.

**Interviewee 6:** middle-level administrators should support employees to learn and master new technologies and provide necessary technical support and training to help them improve work efficiency and quality.

**Interviewee 7:** International cooperation and exchange is an important way to improve the organizational atmosphere. middle-level administrators should encourage employees to participate in international exchange projects to broaden their horizons and enhance team cohesion.

**Interviewee 8:** middle-level administrators should fully consider the opinions and suggestions of employees, form a common development goal, and stimulate the sense of belonging and responsibility of employees.

**Interviewee 9:** Logistics service is the basis to ensure the normal operation of the organization. middle-level administrators should pay attention to the needs of employees' working environment and facilities, provide comfortable working conditions, and improve employees' job satisfaction.

**Interviewee 10:** middle-level administrators should pay attention to team building, strengthen communication and cooperation among employees, pay attention to employees' mental health, and create a positive working atmosphere.

## Evaluation Form

Model for improving information leadership of middle-level administrators  
in public universities in Zhejiang[illegible]

[illegible]

















Appendix D  
The Results of the Quality Analysis of Research  
Instruments

### Reliability Analysis

Simplified Format of Cronbach's Reliability Analysis		
Number of Items	Sample Size	Cronbach's Alpha Coefficient
66	30	0.99

From the table above, it can be seen that the reliability coefficient value is 0.99, Which is greater than 0.9, indication that the quality of the reasearch data reliability is high. Regarding the  $\alpha$  coefficient with deleted items," the reliability coefficient does not significantly increase when any item is deleted. Therefore, it indicates that the items should not be deleted. Regarding the "CITC value," the CITC values for all analyzed items are above 0.4, indicating that there is a good correlation between the analyzed items, which also indicates a good reliability level. In summary, the reliability coefficient value of the research data is higher than 0.9, which comprehensively indicates high data reliability quality and can be used for further analysis.

### The index of objective congruence (IOC)

Model for improving information leadership of middle-level administrators  
in public universities in Zhejiang

No	The current situation of information leadership of middle-level administrators in public universities in Zhejiang	Experts					IOC	Validity
		1	2	3	4	5		
Information literacy (The first variable)								
1	Middle-level administrators have the concept of lifelong learning and development	1	1	1	1	1	1	valid
2	Middle-level administrators have a strong sense of information responsibility	1	1	1	1	1	1	valid
3	Middle-level administrators have a strong level of information technology	1	1	1	1	1	1	valid
4	Middle-level administrators have strong technical application ability	1	1	1	1	1	1	valid
5	Middle-level administrators understand the ethics related to information technology	1	1	1	1	1	1	valid
6	Middle-level administrators understand the laws and regulations related to information technology	1	1	1	1	1	1	valid
7	Middle-level administrators consciously learn knowledge related to education information	1	1	1	1	1	1	valid
8	Middle-level administrators skillfully use information technology to obtain	1	1	1	1	1	1	valid

No	The current situation of information leadership of middle-level administrators in public universities in Zhejiang	Experts					IOC	Validity
		1	2	3	4	5		
	network resources.							
9	Middle-level administrators recognize the latest development trend of educational information	1	1	1	1	1	1	valid
10	Middle-level administrators learn education information policies in a timely and effective manner	1	1	1	1	1	1	valid
11	Middle-level administrators have the drive to tackle difficulties head-on	1	1	1	1	1	1	valid
12	Middle-level administrators be more interested in emerging information technology	1	1	1	1	1	1	valid
Information Vision (The second variable)								
1	Middle-level administrators help the principal establish an information vision that is recognized by all members of the university	1	1	1	1	1	1	valid
2	Middle-level administrators often organize information vision exchange activities	1	1	1	1	1	1	valid
3	Middle-level administrators actively promote new information technology to the university and promote reform during the formulation of vision planning	1	1	1	1	1	1	valid
4	Middle-level administrators make information vision decisions	1	1	1	1	1	1	valid

No	The current situation of information leadership of middle-level administrators in public universities in Zhejiang	Experts					IOC	Validity
		1	2	3	4	5		
5	Middle-level administrators lead the formulation of the department's long-range, medium and near-term information vision planning	1	1	1	1	1	1	valid
6	Middle-level administrators lead the formulation of the vision of the university information management system	1	1	1	1	1	1	valid
7	Middle-level administrators lead the formulation of the vision for the construction of university information infrastructure	1	1	1	1	1	1	valid
8	Middle-level administrators to lead the formulation of university information fund use planning vision	1	1	1	1	1	1	valid
9	Middle-level administrators interpret the university information vision plan to teachers on different occasions	1	1	1	1	1	1	valid
10	Middle-level administrators combine talent training planning, information technology application planning and other planning with policies and regulations in information construction	1	1	1	1	1	1	valid
11	Middle-level administrators make timely adjustments to information vision planning in the process of information construction	1	1	1	1	1	1	valid

No	The current situation of information leadership of middle-level administrators in public universities in Zhejiang	Experts					IOC	Validity
		1	2	3	4	5		
Information construction and management (The third variable)								
1	Middle-level administrators working of the university information infrastructure is relatively perfect	1	1	1	1	1	1	valid
2	Middle-level administrators to provide quality information resources to the whole university is their responsibility	1	1	1	1	1	1	valid
3	Middle-level administrators working of the university has special departments and personnel to manage the university information work is conducive to improving the university information level	1	1	1	1	1	1	valid
4	Middle-level administrators lead the construction of university information-based teaching resources	1	1	1	1	1	1	valid
5	Middle-level administrators actively participate in the construction of information resource platform for teachers' teaching application	1	1	1	1	1	1	valid
6	Middle-level administrators have taken the initiative to participate in higher-level university information construction planning	1	1	1	1	1	1	valid
7	Middle-level administrators provide support for information construction in terms of system and fund planning	1	1	1	1	1	1	valid



No	The current situation of information leadership of middle-level administrators in public universities in Zhejiang	Experts					IOC	Validity
		1	2	3	4	5		
8	Middle-level administrators build a mechanism to improve the information level of teachers and students	1	1	1	1	1	1	valid
9	Middle-level administrators actively promote teachers to implement information-based classroom teaching	1	1	1	1	1	1	valid
10	Middle-level administrators support the use of information management methods in personnel, finance and asset management of the university	1	1	1	1	1	1	valid
11	Middle-level administrators provide rich information teaching resources for teachers and students to download and use	1	1	1	1	1	1	valid
12	Middle-level administrators reasonably allocate funds, human resources and teaching resources to ensure the completion and information construction planning	1	1	1	1	1	1	valid
13	Middle-level administrators effectively implement, manage, supervise and plan the work content related to information technology	1	1	1	1	1	1	valid
Information-based evaluation (The fourth variable)								
1	Middle-level administrators develop a clear information resource evaluation system	1	1	1	1	1	1	valid

No	The current situation of information leadership of middle-level administrators in public universities in Zhejiang	Experts					IOC	Validity
		1	2	3	4	5		
2	Middle-level administrators often use information methods for management or evaluation	1	1	1	1	1	1	valid
3	Middle-level administrators consider information technology ability as a factor for human resource management	1	1	1	1	1	1	valid
4	Middle-level administrators mastery of information technology is an important factor in evaluating educational reform	1	1	1	1	1	1	valid
5	Middle-level administrators regularly organize the evaluation of the university's information vision planning and implementation	1	1	1	1	1	1	valid
6	Middle-level administrators regularly organize the assessment of the university's information teaching	1	1	1	1	1	1	valid
7	Middle-level administrators regularly organize the assessment of the construction of information resources in the university	1	1	1	1	1	1	valid
8	Middle-level administrators regularly organize the assessment of the use of university information funds	1	1	1	1	1	1	valid
9	Middle-level administrators clearly identify the current development status of university education information	1	1	1	1	1	1	valid

No	The current situation of information leadership of middle-level administrators in public universities in Zhejiang	Experts					IOC	Validity
		1	2	3	4	5		
10	Middle-level administrators evaluate the university's information-based teaching environment	1	1	1	1	1	1	valid
11	Middle-level administrators supervise the implementation of the university information plan	1	1	1	1	1	1	valid
12	Middle-level administrators put forward corresponding suggestions on the improvement of information planning according to the implementation of the plan	1	1	1	1	1	1	valid
Organizational atmosphere (The fifth variable)								
1	Middle-level administrators help the principal to set up the university information management team and ensure the orderly progress of the university information construction and planning	1	1	1	1	1	1	valid
2	Middle-level administrators guide all members of the university to create a good information campus culture	1	1	1	1	1	1	valid
3	Middle-level administrators implement the people-oriented management concept everywhere	1	1	1	1	1	1	valid
4	Middle-level administrators maintain a friendly atmosphere between people	1	1	1	1	1	1	valid

No	The current situation of information leadership of middle-level administrators in public universities in Zhejiang	Experts					IOC	Validity
		1	2	3	4	5		
5	Middle-level administrators support each other and help subordinates	1	1	1	1	1	1	valid
6	Middle-level administrators share their experience and skills with their subordinates	1	1	1	1	1	1	valid
7	Middle-level administrators encourage their subordinates to speak out different ideas	1	1	1	1	1	1	valid
8	Middle-level administrators provide regular information training for subordinates	1	1	1	1	1	1	valid
9	Middle-level administrators often communicate and discuss problems in work with their subordinates	1	1	1	1	1	1	valid
10	Middle-level administrators actively listen to the feedback of employees and students on information management	1	1	1	1	1	1	valid
11	Middle-level administrators actively feed back to the principal the problems existing in the information construction of the university	1	1	1	1	1	1	valid
12	Middle-level administrators take the initiative to use the network platform to communicate with other university and share their experience	1	1	1	1	1	1	valid

No	The current situation of information leadership of middle-level administrators in public universities in Zhejiang	Experts					IOC	Validity
		1	2	3	4	5		
13	Middle-level administrators take the initiative to use information methods to search data in the management process and use big data to analyze problems	1	1	1	1	1	1	valid

Appendix E  
Certificate of English



This is to certify that

***Mr. Zhang Wenming***

Achieved BSRU English Proficiency Test (BSRU-TEP) level

**C1**

Given on 22<sup>nd</sup> August 2021

A handwritten signature in blue ink, belonging to Dr. Kulsirin Aphiratvoradej, is positioned above the printed name.

(Assistant Professor Dr Kulsirin Aphiratvoradej)

Director

## Appendix F

### The Document for Accept Research



อว.๘๐๒๓๗ / ๑๗/๐



มหาวิทยาลัยมหาจุฬาลงกรณราชวิทยาลัย

วิทยาเขตนครศรีธรรมราช

๓/๓ ม.๕ ต.มะม่วงสองต้น อ.เมือง จ.นครศรีธรรมราช ๘๐๐๐๐

โทร. ๐๗/๕-๓๔๒๔๙๔ โทรสาร ๐๗/๕-๓๔๕๔๖๒

๒๐ มิถุนายน ๒๕๖๗

เรื่อง รับรองการลงบทความวิจัยเพื่อตีพิมพ์ในวารสารมหาจุฬานาครทรรศน์

เรียน นายจาง เหวินหมิง

ตามที่ นายจาง เหวินหมิง และรองศาสตราจารย์ ดร.นิรันดร์ สุธีนิรันดร์ ผู้ช่วยศาสตราจารย์ ดร.พัชรา เดชโฮม และรองศาสตราจารย์ ดร.จิตติวิสุทธิ์ วิมุตติปัญญาได้ส่งบทความวิจัยเรื่อง “รูปแบบการปรับปรุงความเป็นผู้นำด้านข้อมูลของผู้บริหารระดับกลางของมหาวิทยาลัยของรัฐในเจ้อเจียง” เพื่อพิจารณาตีพิมพ์ในวารสารมหาจุฬานาครทรรศน์ มหาวิทยาลัยมหาจุฬาลงกรณราชวิทยาลัย วิทยาเขตนครศรีธรรมราช ซึ่งได้รับการคัดเลือกเข้าสู่ฐานข้อมูล ของศูนย์ดัชนีการอ้างอิงวารสารไทย (ศูนย์ TCI) ได้ถูกจัดกลุ่มคุณภาพวารสารประจำปี พ.ศ.๒๕๖๒ ให้เป็น วารสารที่มีคุณภาพกลุ่มที่ ๒ (TCI ฐาน ๒) และอยู่ในฐานข้อมูล TCI จนถึง ๓๑ ธันวาคม ๒๕๖๗ โดยจะดำเนินการจัดพิมพ์ในฉบับต่อไปตามระยะเวลาที่ได้กำหนดไว้ และวารสารมหาจุฬานาครทรรศน์ ได้รับบทความวิจัยของท่านเป็นที่เรียบร้อยแล้ว

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

จึงเรียนมาเพื่อโปรดทราบและดำเนินการต่อไป

เรียนมาด้วยความเคารพ

(นางสาวปวงญาดา จงละเอียด)

บรรณาธิการวารสารมหาจุฬานาครทรรศน์

มหาวิทยาลัยมหาจุฬาลงกรณราชวิทยาลัย วิทยาเขตนครศรีธรรมราช

## Research Profile

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