

# The Structure and Development of Teacher Informatization Leadership from the Perspective of Technological Change

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**Abstract:** The development of digital technology has significantly influenced the roles and responsibilities of school leaders. The information and communication technology has triggered the transformation of the public school system which is necessary for the transition from the industrial age to the knowledge economy. Education informatization leadership has become a key factor contributing to the construction and long-term development of school informatization. This paper analyzes the structure and development of teacher informatization leadership, aiming to provide certain reference for follow-up studies by learning from experience.

**Keywords:** informatization leadership; structure; integration

## 1. Introduction

Table 1: Comparison of the development of traditional education informatization and that of future education informatization

Dimensions for comparison	Traditional education informatization	Future education informatization
Technology form	To build a digital campus based on traditional information technologies such as computers and semiconductors	To build a smart campus based on new intelligent information technologies such as big data and artificial intelligence
Development focus	Things-oriented, stressing the construction of information infrastructure	People-oriented, stressing the all-round development of teachers and students
Development task	Application-oriented, promoting the deep integration of information technology and education	Innovation-oriented, prompting education and teaching to develop from integration to innovation
Development method	Taking information technology as an exogenous variable to comprehensively promote the modernization of education	Taking information technology as an endogenous variable to support and lead the systemic reform of education
Development goal	Making education and teaching process networked and digitized, so as to reconstruct the education process	Making education and teaching process intelligent and personalized, so as to form a new ecology of education

In the age of intelligence with artificial intelligence, big data, 5G, and other new technologies as the core, with the continuous development of teacher professionalism, “teacher technology leadership” has become an important topic in international research on teacher and education. In general, the role of technology leadership in a school is played by those who are influential and willing to lead in it. *America 2000: An Education Strategy* issued by former U.S. President George W. Bush in 1991 pointed out that students and educators must possess the capability to use technology in order to improve student learning achievement and enable them to effectively cope with the future technological society.<sup>[1]</sup> Due to the promotion of policies, technology leadership integrated by leadership and technology has become a new trend in leadership research, with a growing body of research focusing on teacher informatization leadership from the perspective of technological change.

With the continuous development of information technology and deepening of education and

teaching reform, the technology form, development focus, development task, development method, and development goal of education informatization have all undergone strategic shifts (as shown in Table 1). Therefore, both education informatization leadership and educational technology leadership have the characteristic of complexity, involving the responsibilities of various stakeholders in education and the whole process of school information technology development, and are affected by internal and external environmental factors. A systematic analysis of present research literature helps to explore ways to improve teacher technology leadership from multiple dimensions.<sup>[2]</sup>

## **2. The Concept of Teacher Information Technology Leadership**

As a very broad conceptual category, teacher information technology application behavior has multiple definitions, involving various information technology competency standards and indicators for teachers (such as National Educational Technology Standards for Teachers, The Standard of Teacher's Ability of Applying Information Technology in Primary and Secondary Schools, etc.)<sup>[3]</sup>. Although there are great differences between different standards and indicators, almost all studies cover four basic issues of application, that is, willingness (the level of attitude), ability (the level of skill), degree (the level of behavior), and effect (the level of efficiency). With the continuous deepening of research on teacher technology leadership at home and abroad, definitions of teacher technology leadership present research differences from various perspectives. However, relevant researchers have reached a consensus on the value and significance of teacher technology leadership in improving the efficiency of school technology application.

### ***2.1 The Perspective of Leadership Behavior***

Teacher technology leadership is viewed as a kind of leadership behavior. Generally speaking, from the perspective of leadership behavior, technology leadership focuses on specific details or aspects of leadership practice. Many scholars believe that technology leadership refers to a leader's behavior of leading and shaping school members to improve administrative and teaching efficacy by means of technology based on technical characteristics and leadership links.<sup>[4]</sup>

### ***2.2 The Perspective of Comparative Research***

First of all, teacher technology leadership is different from principal technology leadership due to the great difference in the leadership style. Principal technology leadership is authoritative in administration, while teacher technology leadership generally is characterized by distributed leadership. Secondly, in fact, education informatization leadership and educational technology leadership have different expressions and basically the same connotation. Compared with education informatization leadership, the concept of teacher technology leadership focuses on the specific level of technology application.

### ***2.3 The Perspective of Integration***

According to the above perspectives, teacher technology leadership is defined as the ability of teachers to integrate their information technology literacy, ability and technological resources into leadership behaviors, which can promote teachers and students to learn and apply technology, improve teaching and administrative efficacy with information technology, and achieve organizational goals and vision. In the age of intelligence, in terms of leadership function, teachers should master the literacy of applying intelligent technology, and have the ability to integrate various resources, so as to encourage the followers to learn and make good use of information technology, improve the intelligent education literacy of teachers and students, and promote the realization of the school's vision with intelligent technology.<sup>[5]</sup>

## **3. The Structure of Teacher Informatization Leadership**

The development of teacher informatization leadership is a dynamic process, with a connotation changing with the continuous development and advancement of information technology and education informatization. As pointed out by Bruce and other scholars, information technology and leadership interact with each other. Information technology creates a new practice environment for leadership

development, thereby changing the knowledge structure of leaders and the nature of leadership. Meanwhile, leadership affects the application and effect of information technology. It is in this interaction that leader informatization leadership is mutually constructed and formed.[6] With the continuous deepening of research on teacher technology leadership. The structure of teacher's technical leadership is shown in Figure 1.

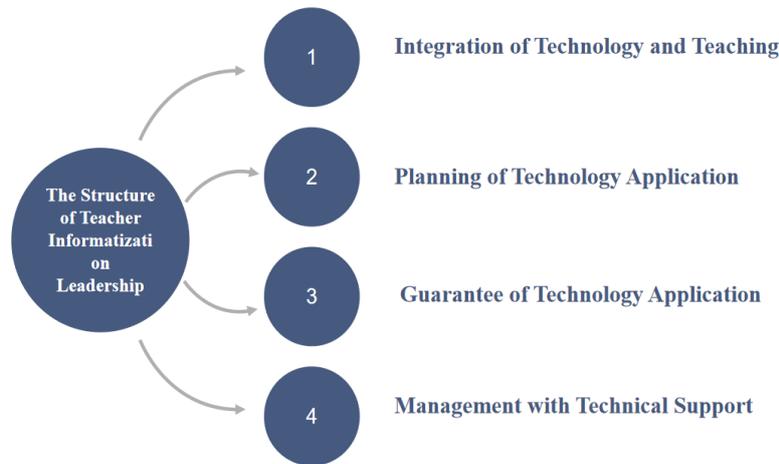


Figure 1: The structure of teacher's technical leadership

### 3.1 Integration of Technology and Teaching

Curriculum teaching is the core link of school education. Since a teacher serves as the leader of intelligent teaching in technology leadership, attention should be paid to the effective integration of intelligent technology and subject teaching to improve the quality of curriculum teaching. Teachers need to focus on improving their innovation ability in teaching technology with the rational use of intelligent tools in learning supervision, learning analysis, etc. Meanwhile, they can maximize the teaching efficacy by exploring its influencing factors based on systematic analysis technics. Specifically, the integration of technology and teaching requires teachers to pay attention to the following four aspects to a certain extent: (1) Teachers should be proficient in using the software and hardware facilities of intelligent technology to improve teaching and learning efficacy; (2) Teachers should support the construction of an intelligent environment for learning in order to promote teaching innovation; (3) Teachers should pay attention to solving teaching problems and improve their teaching skills in the process of using intelligent technology; (4) Teachers should provide students with professional learning opportunities in the application of intelligent technology in order to improve their quality of learning.[7]

### 3.2 Planning of Technology Application

Vision plays a fundamental role in evaluating the efficacy of teacher technology leadership, and technology vision is an important driving force for a school to make changes. In the field of intelligent education, teachers need to establish a technology vision to clarify the application scheme and planning of intelligent technology. An effective technology leader must plan a vision of advancing school transformation with technology. Specifically, in the age of intelligence, the development of teachers' technology planning should focus on the following five aspects: (1) Teachers can promote the integration and application of practice-oriented intelligent technology; (2) Teachers can use big data to provide reference for leadership and decision-making; (3) Teachers should focus on promoting the construction of school culture that is conducive to intelligent education innovation; (4) Teachers should effectively use intelligent technology to guide and support students' learning process, and jointly shape the vision of intelligent learning; (5) Teachers can participate in the leadership practice based on the integration of intelligent technology and design thinking, shape a positive and reasonable view of intelligent education through designing practice, and point out the future trend of the application of intelligent technology in the field of school education.

### **3.3 Guarantee of Technology Application**

Teachers need to mobilize resources to ensure the smooth implementation of smart education plan. Making plans according to different processes enables school members to move towards the expected smart education goals under the guidance of plans, so as to ensure the actual operation of teacher technology leadership. However, the formulation of plans requires corresponding financial support and digital resources as its basis, with internal preparation of school technology budget as well as external pursuit of subsidies and technical resources supporting the smooth implementation of plans. Therefore, teachers should pay attention to the following five aspects in terms of the guarantee of technology application: (1) Teachers should clarify the student-oriented principle in the application of intelligent technology in the field of education; (2) Teachers should effectively allocate funds and human resources to ensure the implementation of the intelligent technology application plan; (3) Teachers should focus on promoting the improvement of intelligent technology application plans to ensure that teachers and students can make good use of the resources obtained; (4) Teachers can pay attention to the scientization and standardization of intelligent technology application, so as to promote the continuous improvement of the application efficacy of intelligent technology; (5) Teachers should be proficient in using the management system based on intelligent technology.[8]

### **3.4 Management with Technical Support**

Teachers should pay attention to the construction of information-based teaching management, and continue to improve their management supported by intelligent technology, which enables teachers to promote the development of intelligent education in communication, motivation, and decision-making to a certain extent. Specifically, management with technical support requires teachers to focus on the following four aspects to a certain extent: (1) Teachers should be able to use intelligent technology to facilitate communication and cooperation with school staff, parents, students and community personnel; (2) Teachers should be able to promote the construction of technology learning community to motivate and support teachers and students to learn intelligent technology and improve work efficiency; (3) Teachers should focus on promoting educational decision-making based on intelligent analysis, providing teachers and students with guidance on intelligent analysis of educational materials and data; (4) Teachers should pay attention to the development trend of intelligent technology at any time, and can promote the effective use of intelligent technology in school environment construction and teacher professional development through reasonable decisions.

## **4. Conclusion**

In conclusion, the development of digital technology has had a significant impact on the reform of teacher leadership. Since school reform is a complex and systematic project, in the process of professional development, principals, administrators, and teachers should think about obstacles, goals and paths faced by the integration of educational theory, information technology, and leadership, and continuously explore and reflect on how to apply information technology to the leadership process. The improvement of the structure of education informatization leadership requires the wisdom and strength of all school members, especially teacher leadership, so as to achieve the modernization of education.

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