

# The Connotative Construction of Digital Transformation in Higher Education

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**Abstract:** With the rapid development of information technology, the digital transformation of higher education has become an important trend in the global education field. This article delves deeply into the connotative construction of digital transformation in higher education, analyzes its internal mechanisms and laws, as well as influencing factors. Through literature review and case analysis, this paper reveals the current situation, existing problems and challenges of the digital transformation of higher education at present. Taking Guangzhou Institute of Science and Technology as an example, this paper analyzes in detail its practice and achievements in the process of digital transformation, providing valuable experience for other universities to draw on. Finally, this paper puts forward the inspirations for the connotation construction of digital transformation in higher education, aiming to provide theoretical guidance and practical references for promoting the high-quality development of higher education.

**Keywords:** Higher Education; Digital Transformation; Connotation Construction; Information Technology

**Online publication:** May 26, 2025

## 1. Introduction

In today's digital age, the rapid development of information technology is profoundly changing all fields of society, and higher education is no exception. As an important force for cultivating high-quality talents and promoting social progress, the digital transformation of higher education has become an irreversible trend. With the wide application of emerging technologies such as the Internet, big data, artificial intelligence and cloud computing in the field of education, the teaching models, research paradigms, management and service methods of higher education are all facing unprecedented opportunities and challenges for transformation.

From a global perspective, many countries have successively formulated strategic plans to promote the digitalization process of higher education. For instance, the Association for Informationization in Higher Education in the United States emphasizes the innovation of educational and teaching models, as well as the transformation of operational models, strategic directions and value propositions through in-depth changes in culture, workforce and technology. European countries are also actively exploring measures and characteristics for digital education transformation to meet the educational demands of the digital age. In China, documents such as the "14th Five-Year Plan for the Development of the Digital Economy" and the "14th Five-Year Plan for National Informatization" issued by the state have explicitly proposed to promote the sustained and healthy development of "Internet + Education", providing policy guidance for

the digital transformation of higher education. A large number of scholars have conducted extensive research on the connotation, goals, and paths of digital transformation in higher education, and have proposed various theoretical models and implementation strategies, providing rich theoretical and practical research references for in-depth exploration of the connotation and realization paths of digitalization in higher education and promoting the high-quality development process of universities.

Based on this, this study will conduct an in-depth exploration of the connotation construction of digital transformation in higher education through the analysis of its connotation and current situation, and in combination with the case of Guangzhou Institute of Technology. It aims to summarize experiences and lessons, and put forward corresponding inspirations and suggestions, with the goal of providing useful references for higher education institutions on the road of digital transformation and helping higher education embrace the digital age. To achieve innovation and development, thereby promoting the high-quality development of higher education and better meeting the demands of social and economic development for talent cultivation

## **2. Analysis of the Connotation of Digital Transformation in Higher Education**

The connotation of digital transformation in higher education is rich and profound. It is not merely the simple application of educational technology, but a comprehensive innovation in multiple aspects such as educational concepts, teaching models, research paradigms, management and services. In terms of the connotation research of digital transformation in higher education, different scholars have different viewpoints. The Association for the Informatization of Higher Education in the United States defines it as a process of innovating educational and teaching models, transforming operational models, strategic directions and value propositions through a series of in-depth changes in culture, workforce and technology. Domestic scholars have also engaged in extensive discussions on the connotation of digital transformation in higher education. The digital transformation of higher education is a process of innovating educational and teaching models, transforming operation models, strategic directions and value propositions through a series of in-depth changes in culture, labor force and technology<sup>[1]</sup>. Digital transformation aims to build a new educational ecosystem through data-driven and other means, and achieve the optimal allocation and efficient utilization of educational resources<sup>[2]</sup>.

The internal mechanism of digital transformation in higher education involves multiple aspects. First of all, technology-driven is an important driving force. With the continuous innovation of information technology, the application of emerging technologies such as artificial intelligence, big data and cloud computing in the field of education has provided strong technical support for the digital transformation of higher education. These technologies can transform teaching methods, optimize the allocation of teaching resources, and enhance the efficiency of educational management<sup>[3]</sup>. Secondly, the transformation of educational concepts is a key factor. The traditional educational concept focuses on the inheritance of knowledge, while the digital age requires the establishment of a student-centered educational concept that cultivates students' innovation ability and lifelong learning ability. This shift in concept has prompted educators to actively explore new teaching models and methods, promoting the in-depth development of digital transformation. In addition, policy support and institutional guarantees are also indispensable. The government formulates relevant policies to guide and encourage universities to increase investment in digital education, improve related systems, and create a favorable policy environment and institutional foundation for the digital transformation of higher education<sup>[4]</sup>.

Explore the influencing factors of the digital transformation of higher education. From the perspective of technical factors, the level of digital infrastructure construction, technological application capabilities, and the speed of technological updates in colleges and universities will all affect the process of transformation. If the network bandwidth of colleges and universities is insufficient and the stability of the teaching platform is poor, it will be difficult to carry out digital teaching activities effectively. The educator factor is also of vital importance. Teachers' acceptance of digital technology, application ability and awareness of teaching innovation are directly related to the quality of digital teaching. Some teachers may, due to the lack of digital training, have insufficient mastery of new teaching technologies and methods, thereby affecting the advancement of digital transformation. The student factor should not be ignored either. Students' digital literacy and

learning habits will affect their utilization efficiency of digital learning resources. Some students may not have good autonomous learning ability and thus find it difficult to adapt to the learning requirements in the digital environment. In addition, the management system and cultural atmosphere of a school will also have an impact on digital transformation. A rigid management system and the lack of a cultural atmosphere that encourages innovation are not conducive to the smooth progress of digital transformation<sup>[5]</sup>.

### **3. Theoretical Foundation of Digitalization in Education**

The theoretical basis of the digital transformation of education involves multiple disciplinary fields. Educational theory provides it with the basic principles and methodological guidance of education and teaching. For example, the constructivist learning theory emphasizes students' active construction and situational learning, which is in line with the way students acquire knowledge through autonomous exploration and interactive learning in the digital environment. Digital teaching resources can create rich learning scenarios for students and promote their knowledge construction.

The theory of information technology provides technical support for the digital transformation of education. Cloud computing technology enables colleges and universities to obtain powerful computing resources and storage capabilities at a lower cost, supporting the operation of large-scale online teaching platforms. Big data technology can collect, store and analyze data on students' learning behaviors, teaching processes, etc., providing data basis for teaching decisions. Artificial intelligence technology can be applied to intelligent tutoring systems, learning evaluations and other aspects to achieve personalized teaching and precise assessment.

### **4. Analysis of the Current Situation of Digital Transformation in Higher Education**

In recent years, with the wide application of information technology in the field of education, the digital transformation of higher education has made certain progress globally. However, while achievements have been made, the digital transformation of higher education also faces many problems and challenges. In terms of technology application, although some universities have introduced advanced technologies, there is a problem that the integration of technology and teaching is not deep enough in practical application. Some online teaching platforms have complex functions, making it difficult for teachers and students to operate them proficiently, resulting in poor teaching effects<sup>[6]</sup>. In addition, there still exist problems such as unbalanced regional development, the failure of digital technology to run through the entire process of higher education, and the insufficient digital literacy of the main body of higher education<sup>[7]</sup>.

From the perspective of educators, teachers' digital teaching capabilities vary greatly. Some teachers have insufficient understanding of digital teaching, lack relevant training and practical experience, and thus find it difficult to effectively integrate digital technology into the teaching process. This restricts the promotion and application of digital teaching to a certain extent.

In terms of students, there are significant differences in their digital literacy. Some students are proficient in using digital technology for learning, but there are still some students who have deficiencies in the use of digital tools, information screening and autonomous learning ability, and it is difficult for them to make full use of digital learning resources. Meanwhile, in the digital learning environment, students' learning attention is prone to be distracted and the learning effect is difficult to guarantee.

There are also some problems at the school management level. The management system and organizational structure of colleges and universities failed to be adjusted in a timely manner during the process of digital transformation, and the traditional management model is difficult to adapt to the development needs of digital education. For instance, in terms of teaching evaluation, traditional examination results are still the main focus, lacking a comprehensive assessment of students' digital learning process and abilities.

## 5. Case Analysis of the Intrinsic Construction of Digital Transformation in Higher Education: A Case Study of Guangzhou Institute of Science and Technology

Guangzhou Institute of Science and Technology has carried out active exploration and practice in the connotation construction of digital transformation in higher education. The school has made significant investments in the construction of digital infrastructure to enhance the campus network environment. Not only has the full coverage of the campus wireless network been achieved, but also the network bandwidth has been significantly increased, ensuring the smoothness of online teaching, scientific research data transmission, etc. In terms of the construction of teaching resources, the school actively develops online course resources. The school encourages teachers to participate in the design and recording of online courses and has built a number of high-quality online courses covering multiple majors. These courses are not only available for students to study independently within the school, but also open to the public through online education platforms, achieving the sharing of high-quality educational resources.

In terms of enhancing teachers' digital teaching capabilities, the school has carried out systematic training work. Regularly organize teachers to participate in digital teaching training courses, covering the use of online teaching platforms, the application of teaching software, and digital teaching design, etc. Through training, teachers' digital teaching capabilities have been significantly enhanced, and an increasing number of teachers are now proficient in using digital technologies to carry out teaching activities. In terms of digitalization of educational management, the school has established an integrated educational management information system. This system integrates multiple modules such as student management, teaching management, and personnel management, achieving centralized management and sharing of data. Through this system, school administrators can obtain various types of data in real time, conduct data analysis and make decisions, which improves management efficiency and the scientific nature of decision-making. For instance, in terms of student management, by analyzing students' academic performance, attendance records, behavioral data, etc., problems existing among students can be identified in a timely manner, and corresponding intervention measures can be taken.

Guangzhou Institute of Science and Technology has achieved certain results in the practice of connotative construction of digital transformation in higher education. The enthusiasm and initiative of students in learning have been enhanced. Through the online course resource platform, students can carry out learning and practical activities more independently. The teaching quality of teachers has also been improved. The application of digital teaching methods has made teaching more vivid, interesting and effective. The educational management efficiency of the school has been significantly improved, and the management cost has been reduced, laying a solid foundation for the sustainable development of the school.

## 6. Implications for the Connotative Construction of Digital Transformation in Higher Education

### *Strengthen the construction of digital infrastructure*

Solid digital infrastructure is an important prerequisite for the connotative construction of digital transformation in higher education. Colleges and universities should increase investment in digital infrastructure, improve the quality of campus networks, and ensure the stability and high speed of the networks to meet the growing demands for online teaching, scientific research and management. At the same time, attention should be paid to the renewal and upgrading of teaching equipment, and more intelligent teaching venues should be built to create a good digital teaching environment for teachers and students.

### *Attach importance to the digital development and integration of teaching resources*

Rich and high-quality digital teaching resources are the key to achieving the connotative construction of digital transformation in higher education. Colleges and universities should encourage teachers to actively participate in the development of digital teaching resources and build diverse online courses, virtual laboratories and other resources.

Meanwhile, emphasis should be placed on the integration and sharing of teaching resources, establishing a unified teaching resource platform to break the phenomenon of resource silos and enable students to conveniently and quickly obtain various high-quality teaching resources. In addition, universities can also cooperate with other universities, enterprises, research institutions, etc., to jointly develop and share teaching resources and broaden the channels of resource sources.

#### *Enhance teachers' digital teaching capabilities*

Teachers are the core force in the connotative construction of digital transformation in higher education. Colleges and universities should strengthen the digital teaching training for teachers and improve their application ability of digital technology and awareness of teaching innovation. The training content should cover aspects such as the use of digital teaching tools, teaching design, and teaching evaluation. In addition, colleges and universities can also organize teachers to carry out digital teaching exchange activities, share teaching experiences and achievements, and promote the common growth among teachers.

#### *Optimize the digital system of educational management*

An efficient digital system for educational management can provide a strong guarantee for the connotative construction of the digital transformation of higher education. Colleges and universities should establish an integrated educational management information system, integrate various management modules, and achieve centralized management and sharing of data. Through data analysis, provide scientific basis for the school's decision-making, and improve management efficiency and service quality. Meanwhile, attention should be paid to the optimization and innovation of the educational management process to adapt to the development needs of digital education.

## **7. Conclusion**

The connotative construction of digital transformation in higher education is a complex and long-term process, involving multiple levels and numerous factors. Through the analysis of the connotation of digital transformation in higher education, the current situation and the case study taking Guangzhou Institute of Technology as an example, we have deeply realized the importance and urgency of digital transformation for the development of higher education. Despite facing numerous problems and challenges during the transformation process, measures such as strengthening the construction of digital infrastructure, attaching importance to the digital development and integration of teaching resources, enhancing teachers' digital teaching capabilities, and optimizing the digital system of educational management can effectively promote the connotative construction of digital transformation in higher education. In the future, higher education institutions should continue to actively explore and practice, constantly innovate educational and teaching models as well as management methods, to adapt to the development needs of the digital age, provide strong support for cultivating high-quality talents with innovative spirit and practical ability, and promote the high-quality development of higher education.

## **Funding**

This work was funded by the School-Based Research Project of Guangzhou Institute of Science and Technology Research on the Connotation Construction and Realization Path of Digital Transformation in Higher Education (Project No. 2024KZ017).

## **Disclosure statement**

The author declares no conflict of interest.

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