



# Teaching Reform and Digital Governance Under the Application of ChatGPT —On the Digital Transformation of Teaching Governance

Bowen Zhang<sup>1</sup> and Jinru Mao<sup>2</sup>(✉)

<sup>1</sup> Guizhou Research Institute of Social Construction, Guizhou University of Finance and Economics, Guiyang, China

<sup>2</sup> Institute of Economics, Guizhou University of Finance and Economics, Guiyang 550025, China

839436581@qq.com

**Abstract.** With the wide application of ChatGPT in teaching, digital teaching is ready to emerge, and puts forward new requirements and expectations for teaching reform and teaching governance transformation. The artificial intelligence technology represented by ChatGPT is gradually changing from the traditional auxiliary teaching means to the role of an independent third party in the modern new teaching relationship, and a teaching revolution with far-reaching influence and fundamental change significance is coming quietly. The combination of intelligent learning machines and teaching elements highlights the technology integration and resource integration between big data, the Internet and mathematical media, which will further promote the digital transformation of teaching governance in the information age. Correct understanding and grasping the digital essence of the teaching revolution in the information age is not only helpful to strengthen the scientific popularization of the information literacy, digital knowledge and technical means of teachers and students, but also has important theoretical and practical significance for deepening the teaching reform, promoting the teaching revolution and the transformation of teaching governance.

**Keywords:** ChatGPT · teaching revolution · teaching reform · teaching governance · digital transformation

## 1 Introduction

Recently, the hot speculation of ChatGPT and its teaching application problem, really attracted a lot of attention. As an artificial intelligence technology based on machine learning, ChatGPT has brought about a subversive teaching revolution, which has aroused wide attention and heated debate. ChatGPT Launch and its application, to deepen the teaching reform, promote the teaching revolution and teaching management of digital transformation has injected a strong driving force, and from the education idea, talent training mode, the mode of teaching and its teaching ideas, teaching content, teaching methods and teaching behavior, and so on many aspects have changed people's teaching cognition, promoting the traditional class teaching form and classroom

interaction between teachers and students gradually to the digital teaching form and teachers, learning machine, students tripartite linkage new teaching relationship. Correctly understanding and grasping the digital essence of the teaching revolution in the information age will not only help to strengthen the scientific popularization of teachers and students' information literacy, digital knowledge and technical means, but also have important theoretical and practical significance for deepening the teaching reform, promoting the teaching revolution and the transformation of teaching governance.

## **2 Digital, Digital Transformation and the Teaching Revolution in the Information Age**

With the wide application of ChatGPT in teaching, digital teaching is ready to emerge, putting forward new requirements and new expectations for teaching reform and digital transformation. The new generation of artificial intelligence technology represented by ChatGPT is gradually changing from the auxiliary teaching means to the role of an independent third party in the new teaching relationship. A teaching revolution with far-reaching influence and fundamental change significance is coming quietly. To accurately understand and grasp the profound changes in the teaching field, it is necessary to clarify the conceptual connotation of digital transformation and its related digital and digital thinking, on this basis, reveal the digital essence of the teaching revolution in the information age, and find the convergence point between the logic and history of teaching reform.

### **2.1 The Conceptual Connotation of Digital and Digital Thinking**

As a profound change in the teaching field caused by the application of ChatGPT and other artificial intelligence technologies, digital transformation is the product of the deep integration of the new generation of digital technology represented by artificial intelligence, blockchain and big data with traditional industries. To accurately grasp the concept and connotation of digital transformation, we first need to make clear what is digital and digital thinking.

The so-called digitization refers to the process of converting information from a character format to a digital format for the computer to read, that is, any continuously changing input graphic information, such as picture lines or characters representing specific meanings, into a string of separate units, expressed by 0 and 1 in the computer. The digital format where graphic information is converted from character format to binary numbers 0 and 1 is achieved by coding technology. Here, characters are the "language" we express on the computer, common including numerical values, letters, words, and symbols. The so-called encoding is the technology of converting characters into binary numbers 0 and 1, and the core is the sampling model and sampling rate selection. According to the sampling theorem proved by Shannon, sampling is a signal (time or space continuous function) into a numerical sequence (i.e., time or space discrete function), if the signal is band limit, and the sampling frequency is higher than twice the signal bandwidth, so, the original continuous signal can be completely reconstructed from the sample. That is to say, through sampling, simple and easy to master methods

can be used to approximate complex objective things, whose accuracy depends on the sampling model and sampling rate. Based on the theory, the electronic computer will transform a lot of complex and changeable information into numbers and data that can be measured, and then establish an appropriate digital model with these numbers and data, transform them into a series of binary code, into the computer, for unified processing. Most of the information in nature is simulated information, mainly in the form of analog signals. It is difficult to guarantee the consistency with the original information in the process of propagation (replication), making it difficult for the final receiver of the information to correctly receive and use the original information. The greatest advantage of digital signals over analog signals is their ease of replication. Therefore, only the original analog information into digital information transmission, and in the first conversion to ensure a certain sampling rate, can ensure the digital information and analog information to a certain degree, then in the process of transmission will not distortion, make the final recipient of the information can use with the original information enough approximate digital information.

Based on the above principle, if we quantify some success events sampling (digital conversion), and then imitate (copy), it can improve our probability of success. In other words, if we quantify the process of a successful case, and then imitate (copy) each detail module, then our success will become a high probability event. Of course, the probability of success depends on the accuracy of the quantitative decomposition (sampling rate) and the process (sampling model). In other words, the idea of quantifying sampling is to decompose complex event samples into simple, standard and easy to replicate “small events” according to a certain sampling model. In this way, the replication of complex sample events can be achieved only by copying the “small events” through the process of the sampling model. We call this way of thinking “digital thinking.” From Shannon’s quantitative sampling idea to Ford’s standardized assembly line thought, and then to McDonald’s standardized replication idea, its essence can be summarized as “digital thinking”. It is under the guidance of this thinking that the western developed countries quickly occupied the commanding heights of the information age. In fact, the biggest advantage of digital thinking is that only need to standardize and modular subdivide and quantify the successful samples, we can copy these small modules quickly and replicate successful events without error, making our success a large probability event [1]. It can be seen that the improvement of information level is not the traditional understanding of hardware facilities and equipment information or the use of information technology means, the more core and key is the thinking mode change and digital transformation of people who use information technology equipment. That is to say, to fundamentally change people’s way of thinking, learn to understand and use this digital way of thinking while using information technology and equipment, in order to master the essentials and essence of information. In the final analysis, information technology is a process of information acquisition, processing, transmission, storage and utilization based on computer application, and its important function is to improve people’s memory and statistical ability. Obviously, digitization is to further enhance the ability of analysis and decision-making on the basis of informatization and the ability to improve memory and statistics.

Thus, digital thinking is based on the perspective of digital function upgrade, breakthrough the digital pure technology viewpoint, its further extension and extension, has a broader intelligent analysis and decision-making vision, learn to use data found problems, analysis problems, make decisions, to further enhance the business risk control ability and market flexible strain ability, to ensure the core competitiveness for the value pursuit of the way of thinking. In the final analysis, digital thinking is a profound change and fundamental update of thinking mode. Its fundamental feature is beyond the traditional uncertainty, general abstract and no data view, with more scientific and rigorous reasoning logic and decision predictability; its essence is through standardization, modular subdivision and quantification, and rapid and error-free replication of these small modules, making success a high probability event.

## 2.2 The Conceptual Connotation of Digital Transformation

Based on the concept connotation of digitalization and digital thinking, it is necessary to investigate and analyze the concept connotation of digital transformation, and to accurately grasp the key points and essence of digital transformation.

On the key points and basic drivers of digital transformation. Zhang Yuguo, senior vice president of Lixun Group in China, summarized the key points of digital transformation as “both hands should be hard”, namely: grasping massive data on one hand and big data analysis technology on the other hand [2]. At present, there are two views of “external cause” and “internal cause” on the origin and basic motivation of digital transformation. Zhang Yuguo believes that the external cause of the digital transformation of enterprises is the external competition pressure, that is, the natural law of “no innovation, no death”. Gao Wei, product director of Law Link (Beijing) Information Technology Co., Ltd., believes that the internal cause of digital transformation is not only the pursuit of excellence, but also the combination of data and digitalization also brings great value to the enterprise [2].

The historical origin and essence of digital transformation. Digital transformation generally has three stages, Namely: the first step is the information of digital transcoding, Turning information from non-digital format to digital format by digital encoding and decoding techniques, Realize a series of digital transformation of information recognition, storage, transmission and exchange, This is a process of information digitization; The second step is the digital business transformation, Using digital technologies and capabilities such as big data, cloud computing, 5G, artificial intelligence, the Internet of Things, and blockchain, Through the Internet of everything, Promote digital information integration and industrial chain business chain collaboration, Generate the data and process, refine and intelligently analyze the data, Realize the reshaping of the business or business model, This is a digital transformation process; The third step is to achieve the experience of value-added business goals, Through the digital upgrading of internal business processes and external transaction processes, To achieve non-centralized military operations under business management under full authorization, As well as employees and customers, consumers, partners, suppliers and other five categories of users “real-time, on-demand, full online, self-service, social” business goals to achieve ROADS experience, This is a business digitalization process of deep integration of business and technology, and comprehensive improvement of service quality. It can be seen that the

essence of digital transformation is the data dependence and total factor digitalization of business models driven by business model innovation, and the core is the digital thinking in the process of data aggregation and fusion, such as storage, classification, computing, analysis, application and evaluation.

In summary, Digital transformation is the inevitable product of the deep integration of large data analysis technology and business processes under market stimulation, It is the digital upgrading of the whole business activities and their processes based on the digital transformation of business information and the digital transformation of business models, Its connotation is the data dependence and total factor digitalization of business model driven by business model innovation, The essence is the intelligent reconstruction and digital upgrading of the production mode, The core is the digital thinking of storage, classification, computing, analysis, application, evaluation and other data convergence and fusion process, The basic characteristics are the controllability and minimization of business risks, the continuous improvement of market competitiveness and efficiency level, the digitalization of total elements and the full realization of value appreciation.

### **2.3 On the Essence of the Teaching Revolution in the Information Age**

The so-called teaching revolution refers to a series of fundamental changes brought about by the wide application of the new generation of artificial intelligence technology represented by ChatGPT in teaching. That is to say, the teaching revolution in ChatGPT application scenarios is not groundless, but stems from the subversive impact of the development of artificial intelligence technology on the educational revolution. To accurately understand the concept connotation and essence of the teaching revolution, it is necessary to make clear what is the subversive impact on the educational reform, so as to investigate and analyze the profound change and digital transformation in the teaching field. Specifically, the “subversive” influence of ChatGPT on educational reform is concentrated in the innovation of educational concepts, and has many specific manifestations in the innovation of teaching modes such as talent training mode and teaching thought, teaching and learning behavior, teaching methods and technical means.

The so-called educational concept innovation refers to the specific organizational forms of new education forms and education and training modes based on intelligent education, online education and human-machine combination, as well as the fundamental update of education and teaching cognition such as curriculum form and classroom structure form. ChatGPT The technical addition has greatly promoted the innovation of educational concept, so that the form of educational organization presents the new characteristics of flat, network, personalized, the curriculum form is also continuing to expand to online courses, network teaching resources, MOOC, flipped classroom and other new curriculum style and learning carriers. The study found that ChatGPT will have a disruptive impact on the educational organization form and teaching cognition from six aspects: first, provide creative ideas for teachers’ curriculum design, assist in searching and sorting out literature, and generate complete curriculum materials, such as syllabus, curriculum plan and reading materials. The second is to help teachers to sort out the general knowledge and normal content, teachers can use the time saved to carry out innovative work. The third is to provide an interactive platform for teachers and students, answer questions in real time, provide ideas for classroom activities, increase the interest

of classroom interaction and teaching, help students understand more complex content and concepts, and become teachers' classroom assistants, students' after-class mentors or debate training partners. Fourth, participate in student evaluation, generate homework tests and exams, help teachers to evaluate students, observe students' learning progress, and timely give feedback on teachers' teaching effect and students' learning effect. Five is to help teachers to deal with the work summary, weekly report, monthly report and other normal affairs work, free from some simple mechanical work, so that teachers have more time and energy to carry out creative work. Sixth, respond to teachers' questions and requests, provide teachers with relevant course teaching resources and technical support, so that teachers can more easily and efficiently obtain and learn information and resources from countries around the world, broaden their international vision and improve their professional level [3].

The so-called talent training mode refers to the abstract summary of theories and methods such as what kind of talents to cultivate and how to cultivate talents to certain educational concepts. The core is the training methods and methods. As for the talent training mode, it can be divided into three levels: concept, system and operation, which are composed of four dimensions: concept, goal, process and effect. Among them, the organic combination of "three levels" reflects the static structure of talent training mode; the "four dimensions" connect and transform reflect the dynamic process of talent training mode [4]. Say ChatGPT promoted the talent training mode innovation, because it is not only on the education concept change people on education organization form and the integrity of curriculum form, pay more attention to personalized, creative training target orientation, and on the teaching content and method of strategy selection pay more attention to course design and teaching implementation link, makes the talent training process implementation and effect evaluation feedback has a more challenging and subversive significance of a series of new changes. Among them, the promotion of curriculum system construction and teaching content selection becomes the top priority of promoting educational reform and innovating talent training mode; the key role of teaching method and means reform and innovation is increasingly prominent, becoming the decisive factor of promoting educational reform and innovating talent training mode; curriculum teaching design and classroom reform have become the core element of promoting educational reform and innovating talent training mode. That is to say, ChatGPT not only brings the education organization form and curriculum form fundamental update, and through the auxiliary curriculum design and teaching implementation, become the teacher's right-hand man, let teachers can have more time to carry out personalized teaching and creative work, this is the ChatGPT education change and the meaning of teaching revolution. This change not only reflects the basic principle of technology determining tactics, but also provides direction guidance for the application of teaching technology means and the innovation and development of teaching academic.

The so-called update of teaching mode refers to the traditional one-way knowledge dissemination and transmission mode of teacher teaching and students' learning, which is gradually transformed into a more democratic and equal knowledge sharing and guidance mode. The biggest change is the absolute realization of the relatively solidified teaching role of teachers and students and the learning of teaching. It is the change of the teaching role of teachers and students and the realization of teaching and learning that

make teaching and learning behaviors and teaching methods more democratic and equal. Moreover, the application of ChatGPT in teaching has changed the application scenario and implementation form of teaching technology means, enabling it to realize artificial intelligence assistance in knowledge and technical issues, thus strengthening students' learning ability. In this case, teaching and learning to get the maximum technical realization, teachers are not necessarily better than students, students are not necessarily at any time, any knowledge acquisition or application link are not as good as teachers, ChatGPT technology addition is profoundly changing the solidified state of teaching role in the teacher-student relationship. This greatly strengthened the students in the teaching relationship, and the teachers leading role in the teaching relationship put forward new and higher requirements, namely, the teachers' leading role is no longer knowledge dissemination, presentation and one-way teaching, but for knowledge application scenarios and the knowledge, technical problems, is more emotion, innovation, and ideas, attitude of non-intellectual factors such as spirit and value guidance. To put it simply, what teachers should do is to strengthen the non-intelligence factors with the help of artificial intelligence such as ChatGPT, and to do the non-intelligence bonus or "fill the gap" that ChatGPT cannot do. This is the subversive teaching revolution caused by the update of teaching technology and means in ChatGPT application scenarios.

Thus, the teaching revolution refers to the ChatGPT, represented by a new generation of artificial intelligence technology application in the teaching of the education idea, talent training mode, the fundamental change of teaching mode, and the resulting teaching ideas, curriculum form, teaching content, teaching methods and means, teaching relationship, teaching and learning behavior, and many other teaching elements of reconstruction and digital transformation, its essence is the structural reorganization of teaching elements and digital transformation.

### **3 Strengthening the Digital Teaching Knowledge and Skills Training is the Key to Promote the Transformation of Teaching Governance**

Since the digital transformation and structural restructuring of teaching elements constitute the substantive connotation of the information age teaching revolution, so, we must study how to solve through the digital transformation in the field of teaching to realize the structural restructuring of teaching elements, this is the current deepening teaching reform, promote the teaching revolution and the premise of the teaching governance transformation, key problems.

#### **3.1 We Should Have a Correct Understanding of the Digital Teaching, and Effectively Solve the Theoretical Cognitive Problem of Where the Digital Transformation in the Teaching Field Turns to**

There is no unified conceptual definition of what is digital teaching, which can be said to be different opinions. To sum up, there are mainly four representative views. The first is "application" said, think "digital teaching is information technology as the carrier, through the application of digital resources, mode and data elements and a teaching

activity”, special emphasis on “digital teaching is to upgrade of the traditional book teaching, text, tables and other traditional teaching resources for digital technology and output, make resources more practical students, knowledge is easier to absorb” [5]. The second is the “classroom shift” said, think “digital teaching means through digital technology, digital teaching environment and teaching data analysis mining, promote from parallel classroom (i.e., students can choose to participate in multiple classroom) to interactive classroom (i.e., students can deeply participation and interaction of multiple classroom) to fusion classroom (i.e., to digital, virtualization, intelligent infinite copy and multiple combination of classroom) shift” [6]. The third is the “teaching activities and teaching mode” said, “The so-called, digital teaching, Referring to teachers and students in a digital teaching environment, Following the modern educational theories and laws, Digital processing of various teaching information resources, Teachers and students to fully harness information technology tools, Using a variety of modern digital information retrieval and acquisition methods, Teaching activities of cultivating compound talents with innovative consciousness and innovative ability with digital teaching mode” Is using digital teaching tools nonlinear, interactive comprehensive processing of teaching text, graphics, images, animation, audio and video and other media teaching information, And enable this information to establish logical connections, By adopting a digital teaching mode to implement teaching activities” [7]. The fourth is “teaching technology and teaching method” said, think “digital teaching refers to the teachers using multimedia technology, in the form of interactive way, the graphics, images, text, animation, video, sound and other media after computer processing, in the form of single or integrated of a kind of teaching technology and teaching method, it emphasizes the combination of people and computer technology” [8]. Comprehensive the above view, digital teaching is based on digital thinking and personalized, targeted, innovative modern education concept, make full use of artificial intelligence, big data, Internet, block chain, 5G digital technology, for the curriculum system and teaching content, teaching methods and teaching media and technology and a series of digital reorganization and structure optimization, to build up innovative spirit and practice ability targeting the new teaching system and operation mechanism. In short, digital teaching is a new type of teaching system and operation mechanism. The core is the interactive integration of digital thinking and modern educational concepts. The goal is the spirit of innovation and practical ability, and the essence is the digital reorganization and structural optimization of teaching elements.

### **3.2 We Should Have a More Comprehensive Scientific Popularization of Information Literacy, Digital Knowledge and Technical Means, and Effectively Solve the Specific Methods and Implementation Strategies of How to Turn to the Digital Transformation in the Teaching Field**

Teachers are the main force to implement digital teaching and promote the teaching revolution. The professional quality of teachers, especially the information literacy, and the understanding and mastery of digital knowledge and technical means, are very important. Accordingly, the key of teaching management is teacher, the key is teacher. Strengthening the training of digital teaching knowledge and skills for teachers and comprehensively improving their information literacy is the top priority in promoting the transformation



of teaching governance, and also the key link of further deepening the teaching reform. Here, digital teaching knowledge and technology including digital teaching media use, teaching resources construction, teaching skills, teaching methods and other operational technology and related skills, and including personalized education, according to their aptitude teaching pertinence, innovative talents training of modern education idea, and teaching theory and teaching principles based on digital thinking. All these belong to the category of scientific popularization of digital teaching knowledge and technical means, and should be included in the compulsory courses of teachers' daily learning and education training. At the same time, must be clear digital teaching knowledge and technical means of science popularization and education training, is different from the previous teaching skills training, also different from the traditional teaching view or teaching lectures, but a full teaching elements digital transformation and structural restructuring of the general mobilization and comprehensive deployment, need a full participation and commitment, to receive the desired effect, fully prepared for the digital teaching. Taking personalized learning as an example, there are new and higher specific requirements for knowledge and skills for the scientific popularization and education training of teachers' digital teaching knowledge and technical means. Here, In terms of the learning process, The key to individuation is the use of adaptive learning techniques, The learning technique is mainly by constructing knowledge maps that reveal the internal connections of subject knowledge, Measurement and diagnostic learners have existing levels, To follow up the learning process of the learners, Collect and analyze learning data from learners, Provide personalized learning programs for learners, Push the appropriate learning resources and learning paths, In the process of repeated measurement, push, learning, and feedback, Grasp the learner's most recent development area, For each, learners with the most suitable learning content and learning pace, Stimulate learners' interest and enthusiasm for learning, Meet the learners' sense of achievement, Build up the learner's confidence, Make each person a unique "this one" [6]. Just think, if there is no adaptive learning technology to use this learning technology, the practical operation of personalized learning and the experience of learners can obtain the expected effects of pertinacity, effectiveness and innovation of teaching? At least in the absence of detailed operation and quantitative analysis of the above learning process, the successful experience of teaching will be greatly reduced. It can be seen that only by paying full attention to and strengthening the education and training of digital teaching theory, digital knowledge and technical means based on digital thinking, can we make the necessary ideological preparation and technical support for deepening the teaching reform and promoting the digital transformation of teaching revolution and teaching governance.

### **3.3 It is Necessary to Strengthen the Information Literacy of Teaching Management Cadres and the Ability to Use Digital Teaching Technology, Give Play to the Positive Guiding Role of Teaching Evaluation and Policy Incentive, and Make Good Use of the Baton of Teaching Management, Which is the Top Task to Promote the Transformation of Teaching Management**

As mentioned above, the key of teaching management is the teacher, the key is the teacher, but how the final effect does not depend on the teacher, but depends on the dominance and innovation of management. The so-called dominance of management

refers to that the evaluation and policy incentive play an irreplaceable leading role in teachers' enthusiasm, initiative and creativity, and can even be said to be the baton for teachers to promote digital teaching and implement relevant teaching requirements. As for the innovation of management, In view of the teaching management cadres as managers should learn to study new situations and solve new problems, Especially in the implementation of the teaching evaluation based on digital thinking and modern educational concept of integration, the implementation of relevant teacher treatment and other policies, the implementation of digital teaching knowledge and technical means of scientific popularization and education training and other work to have the spirit of public service and educational feelings, And uphold the spirit of public service and educational feelings, In-depth grassroots, in-depth teachers, in-depth practice, in-depth teaching line, Vigorously carry out investigation and research, Grasp the problem to be accurate, The analysis of the problem should be deep and thorough, Can come up with the actual ideas and methods to solve the problem, To maximize the enthusiasm, initiative and creativity of teachers, To maximize the benefit of teaching management. Therefore, we must focus on the dominance and innovation of management, make great efforts to promote the professional development of teaching management cadres, and strive to make innovations and breakthroughs in cultivating management experts or experts who understand the leadership of teaching and good management committee. In short, only by improving and strengthening teaching management, striving to improve the professional quality and ability level of teaching management cadres, and making a great difference in teaching management innovation, can we protect the good navigation for promoting the digital transformation of teaching management.

#### **4 Building a Digital Teaching System is the Only Way to Promote the Transformation of Teaching Governance**

As for how to promote the digital transformation of teaching governance, strengthening the training of digital teaching knowledge and skills is the key link, but it is still necessary to build a digital teaching system that conforms to the new situation and new requirements of the teaching revolution in the information age, and seek new breakthroughs from the implementation path and promotion strategy.

##### **4.1 We Should Strive to Get Rid of Path Dependence, Innovate Digital Teaching Application Scenarios, and Build a Platform for the Construction of Digital Teaching System, Which is a Major Strategic Innovation to Promote the Transformation of Teaching Governance**

When it comes to the transformation of digital teaching, people always consciously or unconsciously understand it as in the existing teaching scenarios to apply such as Chat-GPT, Internet, big data, block chain, 5G digital technology, solve the teaching media, teaching content update, teaching methods, teaching effect and a series of specific practice problems. However, the problem lies in that many current systems, scenarios and modes have been difficult to adapt to the changing situation, and we need to carry out fundamental changes. Objectively, we need to break through the tradition, get rid of the

long habit of path dependence, and strive to seek to explore and create new application scenarios. Just like driving a train on a motorway and flying a plane on a racetrack, the functions of these digital technologies are difficult to fully play without exploring new roads. More importantly, the successful replication mode based on refined quantitative sampling cannot be transplanted or transferred in the teaching process, and the application of digital technology has specific standards and environmental support conditions for the application of teaching scenarios. Take the teaching application of ChatGPT as an example. ChatGPT, as the most advanced intelligent learning machine and man-machine dialogue system, should give full play to its powerful natural language understanding and automatic text generation ability in teaching application scenarios. It is not a simple application, but needs to understand, get familiar with and interactive training. As a teacher or a student in the new teaching relationship in the ChatGPT application scenario, we need to first understand and gradually get familiar with the ChatGPT technical realization principle, basic functions, working mode, operation environment and other related knowledge, technical performance and operation methods. Next, we plan and design the teaching process and specific application scenarios in combination with the actual teaching needs and encountered teaching problems. Only by understanding and mastering what ChatGPT can do, as a highly intelligent learning machine, and how to do it, and clarifying what problems they need ChatGPT to help them solve in teaching, can teachers and students enter the teaching application scenario of man-machine combination in a purposeful, planned and step-by-step way. In fact, is not only the teaching and learning relationship between teachers and students, ChatGPT application scenarios and a new teaching relationship for teaching and learning behavior management and evaluation problems, including the teachers' teaching behavior supervision, peer lectures evaluation, teaching management cadre class lectures and evaluation of teaching, as well as the students learning effect and the actual progress of learning monitoring, big data analysis, dynamic data collection, crisis warning and real-time management, and so on, involving object and content is extremely complex, full of variables. Only clear teaching requirements, learning requirements, learning machine performance and other specific characteristics and actual situation, the digital technology and education teaching activity depth fusion, develop digital teaching application scenario based on man-machine combination, build the corresponding digital teaching platform, can gradually get rid of the habit of traditional thinking and path dependence, promote the digital transformation of teaching management.

#### **4.2 The Teaching Process and Teaching Links Should Be Designed Scientifically Designed, Promote the Digital Transformation and Structural Reorganization of Teaching Elements, and Break New Ways for the Construction of Digital Teaching System, Which is the Fundamental Way to Promote the Transformation of Teaching Governance**

ChatGPT The transformation of teaching governance under the application scenario, in the final analysis, is to dare to innovate, to have the courage to break through the traditional teaching mode, and break a new way different from the previous habit thinking, can change the lane and overtake. Its essence is to create a new teaching mode and realize the digitalization and structural reorganization of teaching elements. Here, the so-called

new teaching mode, refers to the ChatGPT application scenarios effective teaching, personalized learning, fine management, multiple quantitative evaluation of man-machine fusion, and with the help of intelligent learning machine and man-machine dialogue system, maximize the teaching mode before class, class, and teaching, learning, tube, evaluation of mutual cohesion and organic combination. Specifically, in the construction of the digital teaching mode of man-machine integration, at least the following four aspects should be promoted: first, to guide students from passive acceptance to active inquiry, and to promote the effective teaching based on man-machine integration. The effectiveness of teaching lies in promoting the development of students and guiding students to learn something. As far as teaching activities are concerned, the classroom is undoubtedly the main position and the key link to improve the quality of teaching. However, teachers, teaching is not equal to the students to learn, and the students to learn is not equal to learn. Only by guiding students from passive learning to active inquiry through teacher teaching, can we say that students have truly become the master of learning. ChatGPT Application scenario effectiveness teaching, is to through the digital technology, digital teaching environment and teaching data analysis mining the three aspects, promote the fundamental change of the traditional classroom, so as to realize from the free for students to choose and peripheral to multiple parallel classroom to can for students depth to participate in multiple interactive classroom to can through digital, virtualization, intelligent way infinite replication and multiple combination of the integration of the classroom. In fact, the fundamental change of classroom structure and functional form is the true meaning of digital teaching. The second is to guide the learning goal from standardization to personalization, and promote the personalized learning of human-machine integration. ChatGPT Applied in teaching, the biggest change is to make it possible to “provide suitable education for everyone”. Looking back on the development course of education in the past hundred years, the learning process of students is always “he adaptation”, that is, learning with the established content, rhythm and method provided by teachers, learners are always passive and forced to obey the rules and procedures. ChatGPT Adaptive learning system in application scenarios is integrated with man and machine. Learners are active, and the content also serves learners. Rules and processes are completely reorganized and reconstructed around the needs of learners. Third, to guide the teaching management from static supervision to dynamic governance, and to promote the fine management of man-machine integration. The application of artificial intelligence technology represented by ChatGPT in teaching has maximized the process of teaching management, the data of management process and the diversification of data collection methods. In this way, not only the teaching management gradually achieve more efficient supervision, and then constantly optimize the management process and mechanism. Through the real-time collection of data from students ‘learning, teachers’ teaching, resource application, platform use and other aspects, the digital twin digital campus and environment are constructed, the teaching governance mechanism of effective decision-making is established and improved, and finally the intelligent management and dynamic governance of the digital teaching platform are realized. Fourth, guide the teaching evaluation from selection to promote the development of students’ personality and promote the multiple quantitative evaluation of man-machine integration. The traditional teaching evaluation function is screening

and selection, but the fundamental purpose of teaching evaluation and even the whole teaching activity is to promote students to grow up better and guide students to do their best self. Multiple quantitative evaluation based on man-machine fusion, the evaluation concept, technology and methods of fundamental changes have taken place, the implementation path is the core literacy, supported by digital technology, build up to strengthen the core literacy oriented teaching evaluation system, focus on complex evaluation task of automation generation, automation score, diagnosis and counseling and a series of intelligent technology, construct the measurement model based on multimodal data and data science depth fusion of computing psychological measurement model, thus greatly promote the digital transformation of teaching evaluation.

#### **4.3 We Should Pay Attention to the Educational Return and Humanistic Care of Digital Teaching, Cultivate the New Form of “Education + Digital” Teaching Under the Application Scenario of ChatGPT, and Increase the Popularity of the Construction of Digital Teaching System, Which is the Foothold of Promoting the Transformation of Teaching Governance**

Currently, the technology of the western society for a new generation of artificial intelligence technology such as ChatGPT excessive hype and excessive superstition, reflected in the teaching field, is “defiant”, see and value more is the “big data” and intelligent learning machine function very powerful, just ignored the invention and application of all technology are inseparable from the people, are human service, humanistic care is the starting point and the foothold of all teaching activities. Specific to the domestic, also have a similar situation. That is to say, is in the digital transformation of teaching new form still failed to get rid of the thought of technology, far out of the practice of scientific superstition, promote the reform of teaching and teaching management transformation, mostly based on the idea of “big data”, has not yet to further the inherent needs of personalized development, lack of multidimensional, individualized “small data” collection, mining and use. In this regard, Mr. Yuan Zhenguo calls it “digital + education”, and thinks it is “cold digital education”. In his opinion, education is an activity aimed at people, cultivating talents for the country and promoting personal development, and an activity with love, righteousness and temperature. Therefore, digital education should be transformed to “education + digitalization” and develop digital education with temperature [9]. Similarly, digital teaching should also shift to “education + digital”, adhere to the people-centered, take learning as the center, in order to promote the development of the free, comprehensive, personalized, for the purpose, in order to solve problems and change innovation as the guidance, education law and the law of development, make technology for education service, in the process of promoting the development of digital teaching education function, make man-machine fusion of digital teaching real return education, the development of the real service. In fact, the so-called man-machine fusion not only refers to the combination of man and the machine, but also includes the fusion of the machine and the environment, which actually transcends the binary relationship between man and the machine. Here, human-machine integration is the multi-interaction of educators, educators, machines and educational environment. It is a new intelligent form that transcends the intelligence of human and machine on the basis of integrating the intelligence of educators and machine. Looking to the future digital teaching,

man-machine fusion can not only change the educators and machine between host and guest separation, make the educators and technology with real fusion of technology and application, but also can reconstruct educators in the form of human-machine integration ontology, make the body, perception, cognition, especially intelligent enhancement, in a more creative way of intelligent products, education teaching activities, realize the ideal of change and value pursuit of the education.

## 5 Conclusions

To summarize, this paper thinks that digital teaching is coming out with the wide application of ChatGPT in teaching, and the new generation of artificial intelligence technology is gradually changing from auxiliary teaching means to an independent third party in the new teaching relationship. A teaching revolution with far-reaching influence and fundamental change significance is quietly coming. Correct understanding of artificial intelligence technology auxiliary teaching of education idea, talent training mode, the fundamental change of teaching mode, and the inevitable result of teaching ideas, curriculum form, teaching content, teaching methods and means, teaching relationship, teaching and learning behavior, and many other teaching elements of reconstruction and digital transformation, is to meet the change, promote the transformation of the necessary premise and important thoughts. At the same time, must strengthen the digital teaching knowledge and skills training, strive to build to adapt to the information age teaching revolution new situation, the new requirements of digital teaching system, from innovative digital teaching application scenario, promote the teaching elements of digital transformation and structural restructuring, cultivating ChatGPT application scenario of “education + digital” teaching new form seek new breakthroughs, the digital transformation of teaching management continuously.

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## References

1. Shi Ming. Digital thinking—a simple and successful approach in the information age [J]. *Information System Engineering*, 2010 (03): 81-83.
2. Data view. Embrace digital transformation and promote the development of data for—The first phase of the Digital Expo “1+1” dialogue was successfully held [EB/OL]. [https://www.sohu.com/a/575592269\\_353595](https://www.sohu.com/a/575592269_353595).
3. Xu Yang. ChatGPT Can you replace the teachers? Teachers who can use ChatGPT well will certainly not lose to [EB/OL]. [https://www.sohu.com/a/641927808\\_121124331](https://www.sohu.com/a/641927808_121124331).

4. Zhang Bowen. To complete and accurately understand the talent training mode from the combination of theory and practice [J]. Journal of Jingchu Institute of Technology, 2010, 25 (08).
5. Zhang Yuguang. How to do a good job in high school English digital teaching work [J]. Campus English, 2023, (01): 180-182.
6. Yuan Zhenguo. Digital transformation of education: what to turn, how to turn [J]. Journal of East China Normal University (Education Science Edition), 2023,41 (03): 1-11.
7. Han Yalan, Deng Haiping. Research on digital teaching of literature retrieval course [J]. Scientific and Technological Information Development and Economy, 2007, (03): 259-260.
8. Cao Xianqing. Digital teaching of animal husbandry and veterinary medicine specialty [J]. Anhui Agriculture Bulletin (the second half month issue), 2009,15 (24): 132-133.
9. Yuan Zhenguo. Education governance in the Perspective of digital transformation [J]. China Journal of Education, 2022,41 (03): 1-6+18.

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