

# Research on Artificial Intelligence Promoting the Reform of Weak Schools Education and Teaching

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**Abstract:** Artificial intelligence provides new opportunities for the reform of weak schools. Based on the fact that weak schools have their own limitations in the reform path of weak schools, this paper starts from the important new era technical factor of artificial intelligence, and uses its value orientation of "precision", "empowerment" and "reshaping" in the reform of weak schools to propose a path for artificial intelligence to promote the reform of weak schools: creating an intelligent environment, home-school collaborative education, a new paradigm of classroom teaching, intelligent training for teachers, a new pattern of student learning, and multimodal education evaluation.

**Keywords:** Artificial intelligence; Weak schools

## 1. Introduction

The reform of weak schools has always been an important issue in the development process of our country. Throughout its reform process, it can be basically divided into two paths: one is external assistance to promote reform, and the other is internal factor reform. The internal and external reform paths have their own emphasis, which has indeed made the overall appearance of some weak schools develop and improve, but at the same time, we should also pay attention to the dynamic attributes of the weak schools themselves, that is, with the development of the times, the weak nature of the weak schools has gradually changed from focusing on "hardware and software" to focusing on "education quality, social reputation and development prospects". In the face of the transformation of "weak representation" of weak schools in the new era, these two paths of change have their own limitations. Based on this, this paper attempts to use artificial intelligence, an important technological advantage of the new era, to explore the specific path to promote the reform of weak schools.

## 2. The Value Basis of Artificial Intelligence in Promoting the Reform of Weak Schools

### 2.1 Intelligently analyze weaknesses and accurately help change

The core feature of artificial intelligence is "accuracy", which is reflected in accurate analysis, accurate diagnosis, accurate supply, accurate decision-making and accurate prediction. "Accuracy" is not individualized, but based on the pertinence under the overall overview. Therefore, for the reform of weak schools, intelligent technology can focus on the weaknesses and reform needs of weak schools and build a long-term reform and development mechanism. Specifically, artificial intelligence technology can accurately capture the resource allocation data of each link of weak schools, generate visual maps, comprehensively analyze the development status of weak schools, accurately diagnose specific weaknesses and weak degrees, provide feasible schemes, dynamically adjust schemes in practice implementation and simulation deduction, and continuously increase the accuracy of forecasting schemes. Intelligent technology helps to establish the concept of demand identification behind public behavior, accurately identify and analyze differentiated public demand expressions, and thus realize the accurate supply of real public demand.<sup>[1]</sup> For example, the input of external resources in weak schools, the "precision" advantage of artificial intelligence not only realizes the co-construction and sharing of high-quality educational resources, but also effectively solves the problem of resource appropriateness, shortens the time of resource integration, and improves the efficiency of internal absorption, transformation and application of resources. Intelligent "precision" technology can also be used for

teachers, students, classroom teaching and other elements of educational activities, accurately analyze teachers' professional development needs, students' personalized learning characteristics, and accurately diagnose the problems in classroom teaching. Therefore, artificial intelligence technology has broken the conventional form of helping change, deepened the transmission of resources based on the Internet, made accurate assistance possible, and effectively accelerated the reform process of weak schools.

## ***2.2 In-depth empowerment of the internal elements of the education field, and stimulation of endogenous change motivation***

The core of the reform of weak schools does not depend on a large number of educational funds and the construction of modern equipment. These are the basic conditions for the reform and development of weak schools, which is understandable in essence. The key lies in how to make these external investments in education stimulate the self-development consciousness of the internal elements of the education field, so as to improve the self-development ability of weak schools.<sup>[2]</sup> The principle of artificial intelligence empowering the internal elements of education field is to provide technical support such as intelligent perception, intelligent algorithm and big data, and realize the intelligence of the basic elements of education field, namely educational tools, so as to automatically analyze the educators, learners, teaching contents and teaching methods of the core elements by using intelligent tools and implement precise intervention.<sup>[3]</sup> The intellectualization of the internal elements of the education field is essentially to construct an intelligent education and teaching environment, thus providing an intelligent cultural education paradigm for weak schools. The intervention of intelligent culture breaks the vicious circle of the inherent bad culture of weak schools, stops the constant internalization of their weak consciousness, helps to form a cultural environment of "intelligence, self-confidence, ecology, pluralism and cooperation", and promotes the recognition of all teachers, students and staff on the educational paradigm of intelligent culture, thus taking the promotion of self-development and school reform as the firm mission of the intelligent era to resort to action. Artificial intelligence empowerment education is the upgrading, optimization and empowerment reconstruction of the internal elements in the education field.<sup>[4]</sup> It stimulates the internal potential of the education subject, realizes its self-driven innovation and development, leads the systematic reform and structural innovation of the internal elements, and realizes the stable output of the internal change power of weak schools.

## ***2.3 Rebuild the weak school education ecosystem and lead the overall reform and development***

Educational ecosystem is the systematic structure of education, which specifically refers to the various elements related to it and the relationship between them in the process of education.<sup>[5]</sup> As a new generation of information technology, artificial intelligence can penetrate the dominant growth factors with its own technological advantages into the weak school education ecosystem, and as an internal variable to promote the overall reform of education, support and lead the overall reform and development. First of all, the invasion of artificial intelligence technology broke the original fixed existence state of weak school education system at the macro level, promoted its more comprehensive, open and deep-seated exchanges and interactions with social systems and other systems, and injected new vitality into the reform and development of the education system. Secondly, artificial intelligence expands the connotation of various elements within the education system. For example, the educational environment expands from the physical space to the intelligent learning space for students to experience the learning process, and the course teaching extends from the standardized knowledge transfer method to the personalized knowledge creation carrier. Furthermore, artificial intelligence extends and improves the interrelationships among various elements within the education system. Artificial intelligence has improved the knowledge transfer relationship among educational subjects. Teachers have changed from professors to guides, and students have changed from recipients to active explorers. Artificial intelligence has also improved the relationship between teaching content and learners. The traditional communication channel is "teacher-teaching content-students", and intelligent technology has opened up a new communication channel of "technology-teaching content-students". Therefore, artificial intelligence to boost weak schools is not a gradual repair and improvement, but focuses on the remodeling, reform and virtuous circle of the educational ecosystem of weak schools.

### 3. The Path of Artificial Intelligence Promoting the Reform of Weak Schools

#### 3.1 Create an intelligent environment

Intelligent campus environment is the basic guarantee for the development of artificial intelligence education. The realization of intelligent campus environment needs the following aspects: first, it provides the infrastructure about artificial intelligence, which includes three terminal systems. First, it refers to the intelligent sensing terminal, which is the input end, and collects information through the perception of all-round data such as images, voices, texts, etc. In practice, it specifically refers to smart bracelets, intelligent robots, monitoring equipment and other facilities; Secondly, intelligent technology terminal, which uses big data, cloud computing, deep learning, knowledge map and other technologies to process and store the collected data. This is the process of information processing and transformation, generating personalized analysis model through intelligent operation, and providing personalized learning suggestions and development plans; Finally, the intelligent application platform and feedback terminal, which is the information output stage, guide the practice through the final information generation results and serve our teaching and management. The purpose of providing all-round intelligent facilities for schools is to break through the data island-like restrictions among data, people and things, and form the data integration of campus interconnection, so as to make better use of intelligent facilities to form an intelligent environment and promote the development of schools. Second, it is equipped with intelligent learning space, which is learner-centered, supported by intelligent technology, breaks down the barriers between physical space and virtual space, supports online and offline mixed teaching, realizes seamless transformation and convergence between formal learning and informal learning, and promotes learners' comprehensive and individual development.<sup>[6]</sup> Intelligent learning space weakens the sense of fragmentation of learning in different scenes, enhances the integrity of learning chain, and provides conditions for the generation of intelligent learning cultural paradigm.

#### 3.2 Home-school collaborative education

In the modern education system, the "isolated island" school education has gradually changed into an ecological education with multi-subject cooperation and multi-situation infiltration. Home-school cooperation is the basic guarantee for maintaining the ecological balance and optimizing the ecological development of education.<sup>[7]</sup> Weak schools need the support of parents, a good and sustainable home-school relationship and the support of the concept of home-school co-education if they want to achieve change. Traditional home-school cooperation has some practical difficulties, such as the lack of close contact, inequality between home and school, and insufficient communication. Artificial intelligence technology provides the possibility for the normalization, systematization and deepening of home-school cooperation. Using intelligent technology to build an intelligent home-school cooperation platform, it can record, analyze and transmit the data of each student's study, school life and mental state in real time, and help parents to know the students' school situation in time. The intelligent platform has intelligent customer service and manual customer service. The intelligent customer service will push the wonderful activities of the recent campus and the wonderful moments of the students to parents from time to time to help parents fully understand the campus and students, and encourage parents to actively participate in the activities. Parents can also communicate and exchange ideas with the artificial customer service on some aspects of the campus and students, and strengthen the concept of co-education. Secondly, parents can also upload their children's home study and living conditions to the intelligent platform, which can deeply and comprehensively analyze each student's learning characteristics according to the data provided by both home and school, so as to recommend personalized learning resources more accurately and formulate specific personalized learning plans. Artificial intelligence technology effectively extends the boundaries of education time and space, promotes the formation of virtual communication space,<sup>[8]</sup> strengthens the communication between home and school, strengthens the vision of co-education among collaborative subjects, and lays the foundation for good education governance.

#### 3.3 A new paradigm of classroom teaching

Classroom is the main position and core link of school education, and teaching is the mainstream form of knowledge dissemination. It can be said that the quality of classroom teaching largely represents the quality of running a school.<sup>[9]</sup> Therefore, classroom teaching is an important focus of artificial intelligence to promote the reform of weak schools. Artificial intelligence empowerment classroom is a reform of traditional classroom, which optimizes and upgrades the teaching process, teaching content

and teaching form of the whole classroom and presents a brand-new classroom teaching paradigm. Analyze students' learning situation before class, that is, use artificial intelligence technology to deeply mine students' learning behavior data, and classify and analyze the students' learning personality characteristics, commonalities, weak knowledge and their mastery, which is beneficial for teachers to prepare lessons and arrange previews before class. Implement man-machine cooperative teaching in class. In the supply of teaching content, the real-time refining and dynamic pushing of classroom teaching resources are realized by using artificial intelligence knowledge map, pattern recognition and other technologies,<sup>[10]</sup> to promote the accurate supply of quality education teaching resources; In the development of teaching activities, the intelligent machine and intelligent platform are used to provide personalized activities and tasks for each student. The intelligent machine gives timely feedback on the success of the task, and at the same time presents the background of the whole task and multiple solutions to the students, broadening their knowledge horizons. After class, the teacher accurately pushes personalized homework on the intelligent platform according to the data obtained in class, so that everyone can consolidate their knowledge and solve vague knowledge, thus realizing personalized teaching. The essence of the new paradigm of classroom teaching brought by the empowerment of artificial intelligence is to reshape the various elements of classroom teaching and the relationship between them, which stimulates the internal motivation of classroom change and lays the foundation for cultivating high-quality talents in the new era.

### **3.4 Intelligent training for teachers**

Teachers are the main body of school education and teaching, and excellent teachers are the basic guarantee for improving the quality of education and the continuous development of schools. However, at present, the overall quality of teachers in weak schools is low, job burnout is obvious, and teaching efficiency is low. Therefore, it is very important to use artificial intelligence to promote the professional development of teachers in weak schools, stimulate teachers' internal motivation and improve their professional beliefs. Firstly, an online intelligent training community is established. In the community, professional teaching and research personnel train teachers, and excellent teachers share their teaching and learning experiences. Through the radiation impact of excellent personnel and high-quality resources, the professional development awareness of teachers in weak schools is stimulated. Secondly, using artificial intelligence and big data technology to support the establishment of digital portraits of teachers, mining the interests, behaviors, needs and characteristics of teachers' learning and professional development in weak schools, comprehensively judging the current teaching development level of teachers, and formulating personalized training programs for them.<sup>[11]</sup> Furthermore, the establishment of a virtual classroom, that is, the integration of teaching and learning by using computer and multimedia technology, can allow teachers everywhere to see and hear each other in a powerful interactive learning environment.<sup>[12]</sup> Virtual classrooms not only truly realize the co-construction and sharing of high-quality teachers' educational resources, but more importantly, provide personalized learning support for every teacher who enters them, understand teachers' learning progress, dynamically record teachers' learning trajectory, and provide accurate diagnosis and guidance for teachers' professional development. Therefore, teachers' intelligent training helps teachers in weak schools to break the shackles and slack caused by weak environment, and urges them to constantly update their professional development consciousness and concepts, optimize their knowledge structure, and regard intelligent knowledge as an essential quality for their professional development, thus providing a power guarantee for the improvement of educational quality and their own development in weak schools.

### **3.5 A new pattern of student learning**

The change of students' learning style is an important factor affecting students' progress and development. Artificial intelligence has promoted the emergence of new learning styles of students, which are mainly reflected in two aspects: first, the learning attitude has changed from others' requirements to self-initiative; Second, the acquisition of learning content has changed from passive acceptance to active inquiry. Artificial intelligence provides technical support for new students' learning. First of all, artificial intelligence has the advantage of "accuracy", that is, using cloud service platform to collect a large amount of learning data in students' learning process, analyzing and processing it with big data technology, constructing an analysis model about individual learning characteristics, and accurately sensing learners' knowledge base, cognitive level, learning style and other learning characteristics; Secondly, artificial intelligence has the advantage of "personality", that is, it accurately pushes the learning content, learning resources and customized learning paths suitable for learners, and promotes learners to learn freely and independently according to their own characteristics.<sup>[13]</sup> The precision and

personalization of artificial intelligence enable each student to fully understand their knowledge mastery, learning characteristics and learning prospect planning. Especially for students with weak foundation, they can follow the recommended learning path step by step and slowly, thus effectively stimulating each student's interest in learning, enhancing their sense of self-efficacy and promoting the change of learning attitude. Artificial intelligence can guide students to find and analyze problems step by step in virtual situations by creating problem-based teaching situations, enjoy the fun of solving problems in inquiry, cultivate their innovative thinking and promote the transformation of learning content acquisition methods. The emergence of new learning patterns of students can improve the current situation of weak schools with different student sources and lazy learning atmosphere, and improve the quality of self-learning by promoting everyone's active and effective learning, thus improving the overall quality of education.

### 3.6 Multimodal education evaluation

Educational evaluation is an important feedback of educational effectiveness and an important basis for teaching improvement, which is related to the learning quality of students and the teaching quality of teachers. The educational evaluation of weak schools emphasizes "only score theory" and result orientation, which is not conducive to promoting the all-round development of students and the professional development of teachers. Therefore, using artificial intelligence to empower education evaluation can promote the reform of education evaluation in weak schools and realize the process evaluation advocated by the new era. Artificial intelligence empowerment education evaluation is to collect, analyze, dig deeply and apply the data of education evaluation in an all-round and whole process by using intelligent technology, so as to realize the intelligent, comprehensive, diversified and professional evaluation of education and teaching process and results, and students' learning process and results.<sup>[14]</sup> Artificial intelligence helps education evaluation to promote the reform and innovation of education evaluation system. First, it emphasizes the participation of multiple subjects in the evaluation subject, and teachers, students, parents of students and other education system personnel can participate in it, realizing multi-perspective evaluation and enhancing the objectivity and fairness of education evaluation; Secondly, pay attention to the dynamic analysis of education evaluation process, record the data of teachers' teaching and students' learning in real time through intelligent monitoring and analysis platform, diagnose the teaching and learning process, provide dynamic feedback and evaluation, intervene in teaching in time and make targeted adjustments; Furthermore, the content and boundary of evaluation have been expanded. Traditional educational evaluation is mainly based on scores and explicit measurable ability. Artificial intelligence makes the content of educational evaluation change from subject cognition and easy-to-measure ability to more difficult-to-measure advanced cognitive skills, such as innovative spirit, practical ability, way of thinking, team consciousness and so on, thus realizing the comprehensiveness and systematization of educational evaluation. Therefore, the artificial intelligence empowerment education evaluation makes the collection of evaluation data move towards adjoint multimodal, and the dimension of evaluation standard moves towards comprehensive three-dimensional, thus making the final evaluation result more effective.

## 4. Conclusion

The application of artificial intelligence in the reform of weak schools will permeate the whole process of school environment, classroom teaching, organization and implementation, evaluation and feedback, and it is of guiding significance to the whole reform process of weak schools, and its importance is self-evident. In the process of various continuous attempts and explorations on the application of artificial intelligence, we should pay attention to its reasonable benefits and well-being while pursuing efficiency, so that the application of artificial intelligence technology can truly become the broad road for the reform of weak schools.

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