

## THE INTELLIGENT EDUCATIONAL TOOL ON CLASSROOM IN CHINA

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### Abstract

At a time when technology is rapidly transforming every aspect of society, the Chinese government has been at the forefront of remarkable education reform. The government has been actively promoting the seamless integration of information technology into the education domain. A good example is the Education Data Action Plan 2.0 released in 2018. This extensive effort has served as a catalyst for accelerating the digitalization of education and provided a rich policy environment for the widespread adoption and innovative application of smart teaching tools (Ministry of Education of the People's Republic of China, 2018). The objective of this paper is to develop the applications, impacts, and challenges of these tools. The focus is on the crucial role of these tools in increasing student engagement, facilitating personalized learning experiences, and promoting educational equity. Using a variety of research methods, including detailed policy framework analysis, detailed case studies, and rigorous empirical data, this study reveals that cutting-edge tools such as AI-driven tutoring systems, smart classrooms, and adaptive learning platforms are uniquely positioned to overcome the daunting challenges facing China's education system, including persistent teacher shortages and regional differences, and that these smart tools have significantly improved students' self-learning abilities and overall satisfaction with the learning process. However, challenges remain, such as over-reliance on technology and ethical issues.

**Keywords:** intelligent educational, tool on classroom

### Introduction

Amid the global digital revolution, there have been major changes in the education sector. China's education system has also been riding the wave of technology. By achieving significant and rapid changes through smart education tools. This change is not accidental. But the night is a good time to plan with a broader national perspective. For example, the plan to develop the next generation of AI by 2017 is a clarion call. Supporting the deep integration of AI in the education sector, the development is a visionary program designed to catalyze education reform and set the stage for the widespread use of AI tools in education. The Education Plan 2035, supplemented by the Education Plan 2035, presents a long-term vision. The emphasis on advanced technology programs to improve the quality of education and promote educational development has laid a solid foundation for the full implementation of smart education tools across the entire education system. These smart education tools are packed with innovation and functionality. Using advanced artificial intelligence algorithms, the platform assesses students' unique learning profiles. It analyzes factors such as individual learning progress, knowledge retention, and learning habits. Based on in-depth analysis, Rostra selects and provides learning content. Breaking the traditional schedule and accurately meeting the different needs of each student. The complete and utter cornerstone of the educational renaissance. It is truly a hub of technological innovation. Smart classrooms are equipped with smart interactive learning boards and VR/AR learning technologies that help students reach a new level of learning. These devices are a bridge to the problem of uneven distribution of educational resources in this region. Helping students in remote areas access high-quality

educational facilities. This helps to gradually reduce long-standing inequalities in educational opportunities. The spread of smart learning devices affects the entire education landscape. It has not only changed teaching methods and learning outcomes, but also opened the door to many challenges and opportunities when integrating technology. In addition, they have been influenced by many social and cultural changes. Exploring this issue is not only an academic exercise. But it is also an important aspect of solving the problem of rethinking China's education system with smart learning devices. Most importantly, it also provides insights and experiences for the development of educational technology around the world. Providing unique Chinese knowledge and solutions in the pursuit of better education.

### **Policy and Technological Foundations**

China's foray into smart education is firmly anchored in a series of policies that artfully blend the "informationization" of technology with the "mutual empowerment" between technology and education. Among the many landmark initiatives, the establishment of *Smart Education Demonstration Areas* in 2018 and the *5G + Smart Education Pilot* projects stand out. In these *Smart Education Demonstration Areas*, education authorities are on the cutting edge of educational innovation, actively seeking out novel and effective ways to meld artificial intelligence, big data, and the Internet of Things seamlessly into classroom teaching. Leveraging artificial intelligence technology, teachers can now perform a nuanced analysis of students' learning trajectories. By poring over multi - dimensional data, including classroom participation, homework performance, and test results, they can craft bespoke learning plans tailored to the unique needs of each student (Zhang & Wang, 2022). Simultaneously, big data serves as a powerful resource - aggregating and analyzing engine. It sifts through the vast ocean of educational resources, allowing teachers to swiftly unearth high - quality teaching materials relevant to their curriculum, thereby enriching the educational experience immeasurably (Liu & Chen, 2020). The Internet of Things technology enables the intelligent management of classroom equipment, such as intelligent lighting systems that automatically adjust brightness based on classroom light and smart air conditioners that automatically adjust operation modes according to indoor temperature, creating a comfortable teaching environment for teachers and students (Zhao & Li, 2021). The *5G + Smart Education Pilot* project is also of great significance. Under the 5G network environment, high-definition live-streaming teaching can be smoothly realized, allowing students in remote areas to listen to lectures from renowned teachers in cities simultaneously and share high-quality educational resources (Brown & Davis, 2022). Government reports emphasize that over 95% of schools in developed areas now use smart tools, while rural areas benefit from satellite remote learning programs aimed at bridging the urban-rural gap. These schools conduct blended online and offline teaching through smart teaching platforms, allowing students to study anytime and anywhere via tablets, smart learning terminals, and other devices. Teachers can assign and grade homework, and monitor students' learning progress and difficulties in real time through these platforms, providing timely guidance. These efforts reflect a dual focus on innovation and equity, although the implementation varies due to differences in infrastructure and socio-economic conditions.

### **Case Studies of Intelligent Tools in Application**

The first is AI-driven tutoring systems, such as iFlytek Smart tablets, which provide real-time job scoring, personalized feedback and adaptive learning pathways. The Intelligent learning platform can create personalized learning plans for students. They take into account students' current level of knowledge, learning goals, and the amount of study time they can allocate. For example, for high school students aiming to improve their English language skills

for upcoming international exams, the platform could design a daily study plan that includes a certain amount of time for vocabulary study, grammar exercises, reading comprehension exercises, and listening training. The program can be adjusted in real time based on the student's progress and performance in daily learning tasks. This personalized approach ensures that students receive learning support precisely tailored to their unique needs, which is difficult to achieve in the traditional one-size-fits-all teaching model (Li & Wang, 2020). However, over reliance on automated feedback risks diminishing critical thinking. In middle school classrooms, students were provided with tablets preloaded with mathematics learning applications to assist in solving complex mathematical problems. Initially, students exhibited enthusiasm for using the apps, as they could swiftly obtain solutions to math problems, thereby significantly reducing the time required for homework completion. However, over time, it became evident that students' performance on math tests without the aid of these apps was subpar. Many students struggled with problems that demanded independent thought and logical reasoning. For instance, when faced with a geometry problem requiring them to prove the congruency of two triangles, numerous students who typically relied on the app found themselves at a loss. They were unable to independently determine the correct proof steps because they had grown accustomed to having the application provide solution strategies. Teachers also observed that during class discussions, students were less likely to propose innovative solutions to math problems. Instead, they tended to search for similar problems within the app's database and attempt to replicate the solutions. This case clearly illustrates that an over-reliance on intelligent educational tools may compromise students' cognitive skills, particularly their capacity for independent thought and problem-solving (Zhang & Li, 2021).

Second is the smart classroom ecosystem, which, as explored by Chen (2025), integrates VR, AR, and cloud-based collaboration tools in advanced career colleges. VR technology may enable students to participate in fully immersive virtual classrooms. For example, in a history class, students can virtually travel back in time to historical events. They can witness the signing of the Declaration of Independence in a virtual 18th-century Philadelphia, interact with avatars representing historical figures, ask questions, and experience the historical atmosphere firsthand. This immersive experience can greatly enhance students' understanding and memory of historical knowledge (Liu & Wang, 2024). AR, on the other hand, can enhance real-world learning environments. In science classes, students can use AR-enabled tablets to view virtual 3D models of complex scientific structures, such as the molecular structure of a compound. By pointing the tablet at a textbook illustration or real-world object, students can see a virtual model floating in the air, rotate the model and explore its internal components. This hands-on and interactive style of learning can make abstract scientific concepts more concrete and easier to understand (Zhang & Li, 2024).

### **Application of intelligent educational tools in distance learning**

At present, with the rapid development of information technology, the application of intelligent education tools in the field of distance learning has become more and more profound, which has brought profound changes to the education model. These intelligent tools cover online learning platforms, intelligent tutoring systems, virtual laboratories and intelligent teaching software, creating more possibilities for distance learning (Chen & Wang, 2020). China has made remarkable progress in the popularization of education, but there is still a large gap between the level of education development in some rural areas and urban areas. In a poor county in Southwest China's Yunnan Province, for example, the introduction of satellite-based smart classrooms has successfully connected students with elite urban teachers. With the help of smart devices, students can break through regional restrictions and receive better educational

resources, which has effectively promoted the equalization of high-quality education opportunities and narrowed the education gap between regions to a certain extent. However, the spread of smart classrooms has not been smooth. On the one hand, the hardware equipment procurement and maintenance of smart classrooms require high costs. For low-income families, the purchase of smart equipment may bring economic pressure, which will affect students' access to these high-quality educational resources. On the other hand, the reliability of the Internet is also a key issue. However, the application of intelligent education tools in distance learning is also facing many challenges. Network stability is the first problem (Li & Zhang, 2021). In some remote areas, the unstable network signal, slow network speed, insufficient bandwidth and other situations often occur, which will cause online courses to be delayed or even interrupted, seriously affecting the coherence of learning and the enthusiasm of learners. Some learners lack self-discipline and independent learning ability, and in the absence of face-to-face supervision in the distance learning environment, they are prone to learning delays, inattention and other problems. Moreover, the operation of intelligent educational tools often requires a certain technical basis, and it is difficult for older learners or groups with lower technical levels to learn to use these tools. Despite the challenges, the future of intelligent educational tools in distance learning is still very promising. With the popularization of 5G technology and the continuous improvement of network infrastructure, network stability will be significantly improved. At the same time, developers of intelligent educational tools are constantly optimizing product designs to make them easier to use. In the future, smart educational tools will play a greater role in promoting educational equity, allowing high-quality educational resources to benefit more people across geographical and economic constraints.

### **Implications and challenges for the future**

It is vital for teachers to continuously improve their ability to use intelligent educational tools. They must not only master the basic skills of these tools, but also be able to integrate them more effectively into instructional design. For example, in the process of teaching design, teachers can make full use of the automatic scoring and data analysis functions of intelligent educational tools, which can not only understand the learning situation of students in detail, but also reduce the management burden of teachers, and then design teaching activities that are more in line with the needs of students. This can improve the quality of instruction, better meet the learning needs of students, and allow educators to focus on instruction.

For students, this can increase their interest and engagement in learning. Their interactive and multimedia richness makes learning more engaging. For example, interactive whiteboards allow for real-time interaction between teachers and students. Teachers can use interactive teaching software on the whiteboard to create engaging lessons, such as incorporating interactive games, quizzes, and group discussion activities. In science classes, teachers can use virtual experiment software on interactive whiteboards to simulate science experiments and make abstract scientific concepts more vivid and understandable. This hands-on and visual learning experience can not only help students better grasp knowledge, but also stimulate their curiosity and interest in learning. In addition, smart learning apps on tablets and smart devices offer a variety of learning methods. For language learning applications, they often use gamification techniques such as setting up vocabulary-learning games, grammar-based challenges, and language-exchange communities. These gamified elements turn the learning process into a fun and rewarding experience that motivates students to actively participate in learning activities. According to a study by Zhang and Liu (2021), students experienced a 30% increase in self-reported learning interest after using gamified language learning applications for two months.

Schools and educational administrations should also take corresponding measures. They need to invest more in educational technology and improve the hardware facilities associated with smart educational tools, such as ensuring stable network connections and sufficient number of devices. At the same time, we should strengthen the construction of educational resource platform, encourage the sharing and co-construction of educational resources, and provide a richer teaching resource environment.

On the other hand, the integration mode of intelligent education tools and emerging technologies such as AI, VR, and AR still needs to be further explored. For example, tools such as AI tutors can tailor content to individual learning styles, increasing satisfaction and academic outcomes. However, concerns about AI replacing educators remain, even though current tools primarily complement rather than replace human roles.

Finally, cross-regional research on the application of intelligent educational tools is also an important direction. Different cultures and regions have different educational ideas and systems. Research on how smart education tools can better adapt to different educational backgrounds and how to promote educational equity through smart education tools in different regions can provide a more valuable reference for the global development of smart education.

## Conclusion

Smart education tools have reshaped China's classrooms, providing scalable solutions to long-standing challenges. In terms of the application of intelligent educational tools, it promotes innovation in teaching models, such as the development of blended learning, and also enhances student-centered learning by meeting individual learning needs. However, they also pose some challenges. Technical failures, such as system crashes, unstable network signals, unstable software, etc., can interrupt teaching, and reliance on these tools can lead to a weakening of students' thinking skills and a degradation of teachers' teaching abilities. While their potential is undeniable, sustainable integration requires addressing ethical, cultural, and infrastructural barriers. By learning from China's successes and pitfalls, educators around the world can leverage AI to build inclusive, future-proof learning environments. To sum up, the research of intelligent educational tools in Chinese classroom is of great significance, and the continuous exploration and research in the future will help to further promote the development and application of intelligent educational tools and improve the quality of education.

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