

# Research on the Challenges and Pathways to Improve the Effectiveness of High School English Teaching in the Era of Artificial Intelligence

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**Abstract.** In the era of artificial intelligence, curriculum standards are constantly changing, and higher requirements are placed on students. Due to the constant availability of time, classroom efficiency must be significantly improved. How to improve classroom efficiency and help students achieve higher abilities within a limited time has become a core issue in the education industry. This study aims to explore the challenges in high school English teaching based on the complexity of the English knowledge system, as well as how current artificial intelligence technology can maximize its auxiliary functions. This article mainly analyzes the challenges and path research of improving the effectiveness of high school English teaching under the background of artificial intelligence. It mentions three challenges: low-level motivation of students, low-level work motivation of teachers, and imbalanced use of artificial intelligence, and proposes corresponding solutions, such as using artificial intelligence to provide personalized feedback, using AI-assisted teaching to help teachers enrich teaching forms and reduce burden, and strengthening cross-cultural communication between AI and English, striving to develop more functions of AI that can be used for English teaching.

**Keywords:** Artificial Intelligence, high school English teaching, effectiveness.

## 1. Introduction

Nowadays, Artificial Intelligence enjoys great popularity among human beings. Due to innovation and development, it is gradually integrated into other fields to play its irreplaceable role. Education is one of these fields, especially in English teaching. With the advent of the era of big data, the requirements for students have changed greatly, which means that as English teachers, the teaching objectives and curriculum design should also be changed accordingly. However, it is extremely difficult for teachers to cultivate excellent students under the new standards with limited learning time and resources. To achieve this aim, a large number of teachers have begun to explore how to maximize the role of AI in their classes. At present, the PPT function has been developed, while other interesting functions are in further experiments, such as utilizing iFLYTEK and iWrite platform to revise students' English essays, meaning that there still exist some challenges under such a circumstance. For example, most high school students have a relatively low level of learning motivation toward the complex knowledge system of English. Therefore, this article will explore the challenges faced by high school English teaching in the era of artificial intelligence to achieve higher results and effectiveness and come up with feasible improvement paths, based on the current challenges, to provide references for further research on the deep integration of AI and high school English teaching.

## 2. Current Situation and Education Objectives

### 2.1. The Definition of Artificial Intelligence

Generally speaking, Artificial Intelligence refers to a new technological science of technology and application systems used to simulate, develop, and expand human intelligence. AI contains a wide variety of fields, such as aliens and robots. With the rapid development of science and technology, human beings are becoming more and more receptive to AI. That is to say, AI has gradually played

an increasingly important role in humans' lives, meaning that AI begins to integrate into the human world with multiple identities and in multiple forms. Taking robots as an example, there are already industrial robots, household robots, entertainment robots, and so on. More and more people have realized that taking a high-quality photo is becoming easier and there is no need to bring cash every day. Mobile apps are even able to automatically identify humans' preferences and recommend related materials accordingly, while facial recognition and voice recognition are also becoming increasingly precise. More surprisingly, artificial intelligence has become a hot subject, whose aim is to explore its specific functions and maximize its magical achievements. Jin et al. pointed out that AI-enabled applications can be used for prediction and personal learning [1]. They mentioned some useful applications, like Learning Clues, Purdue's "Charlie", Career Highways, Pitch Vantage and Virtual Speech, AI for Personalized Adult Learning and Online Education at Scale, and Data-Driven Personalized Feedback at Scale [1]. Some of these applications have the capability of simulating real scenes and providing personalized experience and timely feedback, which provides comprehensive benefits to all fields [1].

## **2.2. New Standards for High School English Teaching**

The current social development and economic construction in China have put forward higher requirements for the foreign language literacy of citizens. Foreign language education in high school is an important process for developing the foreign language capacity of the whole nation. It should not only meet the needs of students in terms of mental and emotional attitudes, as well as employment, further education, and future development but also comply with the national standards of the national economic construction and technological development, which are designed for talent cultivation. Therefore, foreign language education in high school has multiple humanistic and social significance.

According to the New Standard of English Curriculum, there have been changes in two main aspects. One is in the course plan; the other is in the subject curriculum standard. As for the course plan, it further clarifies the positioning of general high school education, aiming to improve the comprehensive quality of students, including ideal and faith, sense of social responsibility, scientific and cultural literacy, lifelong learning ability, self-development ability, and communication and cooperation ability. Besides, it further optimizes the curriculum structure, mainly by adding the language variety and adjusting course categories, and it strengthens the institutional construction for effective implementation of the curriculum, increasing the policy of condition protection, management, and supervision. In terms of subject curriculum standards, it condenses the core competencies of the discipline. To be more specific, it is concretizing and refining the Party's educational policy. Meanwhile, it updates teaching contents and academic quality standards, with enhanced guidance for teaching and evaluation.

## **2.3. Integration Between AI and High School English Teaching**

From the perspective of the standards of the new curriculum reform, teachers should design comprehensive, relevant, and practical teaching activities that conform to the psychological characteristics and cognitive level of students in their teaching design. Gong claimed the problems in high school English teaching under the background of the new curriculum reform [2]. The problems can mainly be divided into four aspects: Lack of students' subjective status; Inflexible teaching content; Constrained teaching model; and an Imperfect evaluation system [2]. Therefore, measures urgently need to be implemented, one of which is to integrate artificial intelligence technology with high school English teaching. With AI's diverse functions, such as simulating real scenes and providing personalized experience and timely feedback, teachers can save time and improve teaching efficiency, so that it is feasible for them to devote more time and energy to the learning situation of students in daily teaching and evaluation.

### **3. Current Challenges and Insufficiency**

Although AI indeed brings great benefits, there are still some aspects of challenges that need to be dealt with. Those aspects can be mainly divided into three aspects: students' aspect, teachers' aspect, and AI technology's aspect.

#### **3.1. Analysis from Students' Perspective--Lack of Learning Motivation**

In terms of students' aspect, the most obvious challenge is students' insufficient learning motivation. As for English subjects, especially in high school, most students complained that there was a large quantity of English words to remember and difficult grammar to master. Therefore, it is easy to lack motivation or lose confidence during the learning process, meaning that it requires effort and perseverance. Li analyzed the reasons why students have little interest in English learning [3]. As she mentioned, on the one hand, students have a lower perception of the practical application of English in their daily lives and future career planning, leading to insufficient emphasis on learning English [3]. On the other hand, due to the need to learn other important skills well, English may not receive sufficient attention, which further weakens students' learning enthusiasm [3].

Meanwhile, it is worth mentioning that teaching method is the critical factor affecting students' motivation. As is well known, student-centered education is the most advocated teaching method currently. Unlike traditional models of teachers giving lectures, only by mobilizing students' enthusiasm and encouraging them to participate in classroom self-directed learning can they meet the standards of the New Curriculum Reform. That is to say, it is recommended to design fascinating in-class activities, while monotonous lecturing makes it easier for students to be distracted in class. If students have a strong interest in learning English, the mystery of English will be continuously explored, and the deeper they explore, the more decent scores they will get.

In conclusion, to reach the students-centered mode, it is more significant for teachers to design interesting in-class activities to draw students' attention so that achieve satisfying results.

#### **3.2. Analysis from Teachers' Perspective--Teacher Demotivation**

In terms of teachers' aspect, teachers' work enthusiasm greatly affects work efficiency. Some researchers have found that there are several factors contributing to teacher demotivation. One of these factors is excessive workload. Kong made an investigation, showing that the average daily working hours of teachers are generally long, with 52% working 8-10 hours per day, and about 18% working 10-12 hours per day [4]. They must prepare lessons, revise homework, write lesson plans, listen to and evaluate other teachers' lessons, and participate in teaching research activities [4]. Besides the teaching workload, there are heavy non-teaching workload, including filling out forms, organizing files, and studying party building [4]. According to the result of the investigation, nearly 94% of teachers hope to reduce their non-teaching workload [4]. Later Zhang analyzed the causes of teacher demotivation mainly from three aspects--students, teaching, and administrative [5]. Students' misbehavior and unconcerned attitude can lessen teachers' motivation [5]. Lack of formal and comprehensive training, the limited time for doing research, the uncomfortable teaching environment, heavy workload, low salary, unacceptable teaching methods, and low social recognition could all be potential motives for decreasing teachers' satisfaction and interest in their position under such a stressful condition [5].

It is universally acknowledged that high school English teachers bear the heavy responsibility of morning reading and supervising students to memorize vocabulary and texts every day. They not only need to prepare a vivid lesson containing specific teaching aims and demonstrate it without any mistakes but also provide timely feedback on classroom performance and homework accuracy. Besides it is required to regularly communicate with both students and parents to establish trust relationships, and to avoid excessive pressure or other negative impacts on students. In addition to the school's weekly research activities and open-class activities, teachers are often sent on distant trips to learn from excellent lectures, participate in open-class competitions, or present research results in

public. With too many tasks to complete, teachers are prone to physical and mental exhaustion, losing their sense of professional identity and work enthusiasm, which will lead to some detrimental effects, such as generating depressive emotions. Therefore, how to improve the sense of professional achievement and happiness of teachers is a very important and urgent matter.

### **3.3. Analysis from AI Technology's Perspective--Non-Use & Over-Reliance**

Alghameeti analyzed the current research on the use of virtual reality in foreign language learning [6]. The results of this study indicate that Virtual Reality is a valuable and applicable tool in language education so integrating Virtual Reality into language classrooms can improve the effectiveness of learners in various skills [6]. However, due to the rise and development of Virtual Reality technology in foreign language teaching, further research is needed to investigate the effectiveness of virtual reality in foreign language learning for high-tech students, to fully understand its potential [6]. In addition, more research is needed to investigate the integration of virtual reality and other methods implemented in language classrooms [6].

With the continuous innovation of technology, AI big intelligence models have emerged, the first of which is ChatGPT. ChatGPT can generate articles and PPTs according to requirements in a short period, which is of great assistance to any field. However, not everyone is familiar with big data models such as ChatGPT, which means that a large number of people, including English teachers, are not able to fully utilize the role of big data models. In other words, big data models have not yet fully integrated with educational elements, which is a challenge for teachers' innovation and the development of AI big data models in the present society. But is it good for English teaching to rely entirely on AI? The answer is no. Undeniably, the effectiveness of AI big intelligence models is indeed significant, but they still may produce inaccurate or inconsistent results. Jiang et al. made an investigation into the robustness and efficiency of four LLM tools in assessing writing works, namely GPT-3.5, GPT-4, iFlytek, and Baidu Cloud [7]. The results illustrated that as for robustness, iFLYTEK achieved the highest number that matched with human ratings, which was 81.3%, followed closely by GPT-3.5(80.6%) and GPT-4 (80.1%). As for efficiency, iFLYTEK exhibited the shortest time and most cost-friendly [7]. However, it is clear that as a platform, although iFLYTEK has shown a high level of intelligence compared to other platforms, there are still over 10% of results that do not match human evaluations. This means that there is still room for improvement in current technology, and humans must not overly rely on such platforms. What's more, over-reliance may hint at the creative process and the development of critical thinking skills. Meanwhile, it is worth mentioning that there might be plagiarism and original issues, privacy and confidence concerns, and potential for bias and discrimination. Therefore, the breadth and depth of the application of AI technology disciplines have not completely reached the needs yet.

## **4. Feasible Measures to Deal With Challenges**

### **4.1. Provide Interest Resources and Personalized Tutoring**

Jacobsen et al. provided an extremely creative presumption of possibilities for learning in the game. Although there are related issues with learning in games, such as unpredictability, complexity (i.e. implementation difficulty), and challenges in resource requirements, some feasible measures are being studied [8]. But preliminary conclusions can be drawn from the learning cases around teaching, that is, integrating learning into games greatly improves students' motivation and learning efficiency. If the related problems are further solved, it is expected to change the monotonous nature of learning.

Huang et al. and Wu et al. both pointed out that VR can generate feelings and experiences in corresponding real environments [9,10]. It can also provide students with a highly immersive experience, and stimulate their writing inspiration, thereby enhancing their learning and cultivating their creativity [9,10]. Meanwhile, the study also found that applying virtual reality technology to writing teaching can effectively improve students' writing grades and promote their transferability [9,10]. Zhang claimed that an online education platform called iWrite integrates English writing,

appointment tutoring, review, and summarization [11]. It has the advantages of comprehensive evaluation of essay content, accurate identification of writing problems, assisting students in independent training, timely feedback and correction of teaching points, etc., breaking the limitations of time and space [11].

As a result, English teachers need to stay updated with the latest AI tools and technologies to effectively integrate them into their teaching. While AI can provide effective grading and feedback, teachers need to ensure that students still receive equal human interaction and support.

#### **4.2. Enriching Teaching Forms and Reducing Working Burden through AI-Assisted Teaching**

Teachers have begun to use PowerPoint to improve teaching efficiency and effectiveness. Under this circumstance, teachers are still overwhelmed by various tasks. One way to reduce the working burden is to use AI tools to differentiate instruction and meet the unique needs of each student, promoting more inclusive and effective learning environments. The research of Liu et al. has shown that the various core elements in the model form an organic whole that is interconnected and interacts with each other [12]. The collaborative cooperation among the elements effectively improves the teaching and learning efficiency of the teaching model, achieving good teaching results [12]. With AI assisting in evaluating students' mastery of vocabulary, understanding of articles, accuracy in expressing ideas, and fluency in communication, it not only enriches teaching forms and evaluation forms but also releases teachers from stress, so that teachers can balance work and family and own more patience and energy to focus on the condition of each student. With AI-assisted teaching, teachers have an opportunity to educate students about the ethical and responsive use of AI, preparing them for a future where these technologies are comprehensively valid.

#### **4.3. Encouraging Interdisciplinary Communication and Developing More Functions**

As mentioned earlier, VR has played a significant role in promoting the teaching and learning process, but there is still a need to continue researching and tapping into its potential. Therefore, through the exploration and experimentation of researchers, a more advanced SVVR technology has gradually been proposed based on VR technology. SSVR technology, also called Spherical Video-based Virtual Reality, was proposed by Luo et al., which contains three learning stages: the concrete experience stage, the reflective observation stage, and the abstract conceptualization stage [13]. This technology aims to provide students with the perspective of a pair of 3D glasses, so that they feel like they are in a real scene, going to see, listen, and experience it, and then record and describe it all using English words, rather than simply listening to the teacher's lecture. Through experience, students need to demonstrate their logical thinking ability and creativity in these scenes and learn with a purpose in mind. It has also been mentioned that when ChatGPT plays a significant role, iFlytek has also developed successfully and surpassed the potential of ChatGPT in various aspects, meaning that more functions have been developed with time.

There is a famous saying that leaves professional matters to professional people to do. Therefore, English teachers should explore the teaching application of AI technology and strive to achieve interdisciplinary communication in addition to daily teaching, providing feasible developmental directions for AI experts to achieve better integration of education and AI as soon as possible.

## **5. Conclusion**

The profession of teaching involves a significant amount of hidden workload in addition to daily teaching. This is particularly prominent in high school English teaching, as there are additional tasks such as early reading and memorization supervision, and the pressure to improve student performance during this stage of high school is also very high. Many teachers not only cannot balance work and life for various reasons but also cannot be proficient in teaching. Therefore, it has become an urgent topic to focus on whether artificial intelligence can be better applied to high school English teaching under the artificial intelligence background. Based on the results of this research, artificial intelligence

has brought many advantages to high school English teaching, such as timely feedback, multi-angle evaluations, personalized guidance and recommendations, and unlimited learning resources, which have greatly improved teaching efficiency for English teachers. However, at the same time, there are also many challenges in the practical process of integrating artificial intelligence with English teaching, not only due to its shortcomings but also because both teachers and students have not gotten used to AI-assisted teaching. Therefore, a period must be needed to develop more outstanding functions of AI and put them into practice appropriately and effectively. As the integration of AI and education deepens, there is a high possibility of potential risks in the future, such as ethical issues that have not been mentioned. It is also worth mentioning that at present, only the current results can be seen, and whether this effect can be sustained or transferred is still an uncertain trend, meaning that it requires further attention. Therefore, researchers should keep pace with the times, not only to promote artificial intelligence to play its advantageous role but also to address risks and actively explore the path of harmonious coexistence and development between human beings and AI technology.

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