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Research Strategies and Practices of AI-Driven Secondary School English Teaching

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Abstract

This study provides an in-depth analysis of the traditional challenges faced in secondary English education, including stereotypical teaching styles, lack of personalized education, lack of resources for teaching and research, and constraints on teachers' professional growth. This paper proposes that the incorporation of Artificial Intelligence (AI) technology provides novel solutions to address these challenges. It enhances the interactivity and practicality of language learning through an intelligent context simulation system, customizes personalized learning paths using big data analysis, optimizes the allocation of teaching resources with the help of intelligent literature retrieval and analysis tools, and promotes teachers' professional development through a teacher skills assessment and feedback mechanism. Looking ahead, the deep application of AI in education will bring more efficient, personalized and intelligent changes to secondary school English teaching.

Keywords: Artificial Intelligence(AI); Secondary English Teaching; VR Virtual Technology; Personalized Recommendation

1. Introduction

In recent decades, the Chinese government has emphasized the strategic role of English in national education policy (Ng et al, 2024). As early as 2001, in *the National English Curriculum Standards for Compulsory Education*, English was introduced as a compulsory subject from the third grade of elementary school, and in some regions, it was taught on a trial basis from the first grade. Subsequently, *the Outline of China's National Medium- and Long-Term Education Reform and Development Plan (2010-2020)* further reinforced the importance of English in developing

international competence and enhancing national soft power. These policies reflect broader efforts to align domestic education with global standards and prepare students to participate in an increasingly interconnected world, and English, as one of the three core subjects, scores a maximum of 150 points, alongside language and mathematics, and accounts for a significant portion of the total score. Its weight in the overall assessment structure makes it a decisive factor in determining a student's eligibility for admission to a prestigious university. Performance on the English section of the GCE not only affects individual educational trajectories but also reflects broader systemic priorities in language education. The prominence of English in this high-stakes test underscores its perceived value in the national strategy for talent development and reinforces its position as a core academic competency in China's secondary education system.

Nowadays, in the field of secondary school English teaching research, there are many problems that need to be solved urgently.1) At the level of teaching methods, the traditional teaching mode accounts for a large part of the teaching, and Students are mostly in a state of passive knowledge acceptance, with low classroom interactivity and participation. Surveys indicate that students' interest in English learning increases slowly under this mode. 2) Lack of personalized teaching, which is not able to adapt to the different levels and styles of students' learning. It is difficult to meet the needs of students with weak fundamentals and those who have the ability to learn. 3) In terms of teaching and research resources, it is difficult to collect data related to students' behavior in class, and it is difficult to obtain comprehensive and accurate data due to the limitations of school curricula and the degree of students' cooperation, etc. The integration of these resources is extremely limited, and the resources, such as teaching materials, lesson plans, and test banks, are scattered and they lack of a unified system. 4) In terms of teachers' professional development, the training content is often disconnected from the actual, too theoretical and not enough practical application guidance; and teachers lack continuous feedback in addition to regular assessment, and the daily teaching details of the feedback is scarce, It is difficult to adjust the strategy in a timely manner.

In recent years, Artificial Intelligence (AI) technology has made remarkable progress. Breakthroughs have been realized in the fields of natural language processing, computer vision, machine learning, and deep learning (Aihaiti, 2015). Nowadays, the application scope of AI is extremely wide, covering many industries such as automatic driving, intelligent education, medical diagnosis, financial analysis and intelligent customer service, which greatly improves the production efficiency and creates a series of new innovative models. In the field of education, AI is mainly applied to intelligent learning platforms, personalized education programs and automated scoring systems. Through these technical means, the teaching content can be customized for students based on their learning reality, thus effectively improving the efficiency of learning.

This paper will mainly introduce some dilemmas and challenges faced by the traditional English education industry, and combine AI with some innovations for the implementation of these challenges. The objectives of this study are threefold: (1) to analyze the key dilemmas in traditional secondary school English teaching; (2) to establish the necessity of AI integration through theoretical and practical lenses; (3) to propose AI-enabled implementation pathways

addressing each challenge. The paper is organized as follows: Section 2 examines traditional teaching dilemmas; Section 3 explores the role of AI in education; Section 4 presents AI-enabled solutions; Section 5 discusses future implications; and Section 6 concludes the study.

2. The Dilemma of Traditional English Teaching in Secondary Schools

The dilemmas faced by traditional secondary school English teaching can be summarized into four key areas: teaching methods, lack of personalized instruction, insufficient teaching and research resources, and inadequate teacher professional development.

2.1. English teaching methods

The current secondary school English teaching research is still relatively obvious traditional path dependence, the teacher-centered traditional teaching paradigm continues to dominate (Schulte et al, 2022). The unidirectional knowledge transfer structure formed under this paradigm makes the roles of teachers and students show solidified characteristics: teachers act as the authority of knowledge to implement indoctrination teaching, while students are in a passive position of receiving knowledge for a long time. Taking grammar teaching as an example, teachers usually adopt the teaching method of breaking down grammar rules and demonstrating typical examples, and learners mostly stay at the level of mechanical memorization, lacking the independent inquiry and practical internalization of grammar rules. It is worth paying attention to the fact that this teaching mode has obvious limitations in stimulating learning motivation, and students' willingness to participate in the classroom is generally low, which makes it difficult to form effective teacher-student teaching interactions.

2.2. Lack of Personalized Teaching

Students have different levels, learning styles, and progress rates in English, yet the current teaching methods are difficult to meet the individual needs of each student. For students with a weak foundation, the uniform teaching schedule in class often makes it difficult for them to keep up with the pace, and they may become more and more confused and frustrated in the learning process, gradually losing their confidence and interest in learning English. For students with strong learning ability, the uniform teaching content will make them feel too simple and unable to satisfy their strong desire for knowledge, which in the long run may lead to their slacking off in English learning and limit the further improvement of their English literacy. This teaching situation needs to be improved in order to better take into account the learning needs of different students.

2.3. Teaching Research Resources

Secondary English teaching research faces significant challenges in data collection and resource integration, which directly affects the scientific assessment of teaching strategies and the advancement of research. In terms of the assessment of the effectiveness of teaching strategies, research needs to be supported by a large amount of data. However, in the actual teaching environment of secondary school English, it is not easy to collect comprehensive and accurate data. For example, in order to grasp the changes in students' learning attitudes under different

teaching methods, long-term tracking records are needed, which are constrained by a variety of factors such as school curricula and students' willingness to cooperate. The integration of resources is also limited. Teaching research involves a variety of resources such as textbooks, lesson plans, test banks, multimedia materials, and so on, but these resources are usually dispersed on different platforms or by individual teachers. It is difficult for researchers to effectively integrate these resources to build a complete teaching resource system, which is extremely unfavorable to the in-depth expansion of teaching research.

2.4. Teacher professional development

There is a disconnect between the content of teacher training and actual needs. The content of the professional training that teachers participate in often does not match the urgent needs in real teaching situations (Duraes et al, 2024). For example, some training focuses too much on instilling theoretical knowledge, but neglect how to apply these theories in real classroom situations to deal with practical problems, such as how to deal with students' nervousness in speaking classes, etc. There is a lack of continuous feedback and guidance. Teachers need to be aware of the effectiveness of their teaching and the problems they have in the teaching process. However, there is no effective mechanism to provide continuous feedback. In addition to regular teaching evaluations, there are few ways to provide feedback on the details of teachers' daily teaching, which makes it difficult for teachers to adjust their teaching strategies quickly. As shown in Table1.

Table1. Classification table of English teaching dilemmas in secondary schools

Classification	Issues	Specific manifestations/examples
English Teaching Methodology	Path dependency and one-way knowledge transfer dominate.	Teachers' indoctrination, students' passive acceptance; mechanical grammar teaching, lack of practical internalization; low classroom participation, insufficient interaction.
Lack of individualized instruction	Uniform instruction does not meet the differentiated needs of students	Weak students can't keep up with the progress, leading to frustration; more capable students lose motivation due to the simplicity of the content, limiting the improvement of their English literacy.
Teaching and Research Resources	Difficulty in data collection and insufficient integration of resources	Long-term tracking data is limited by curriculum/fit; resources such as textbooks/lesson plans/test questions are scattered, making it difficult to build a complete system
Teacher professional development	Disconnect between training content and actual needs and lack of continuous feedback mechanisms	Training emphasizes theory over practice (e.g., lack of guidance on emotional management in speaking classes); lack of detailed feedback on daily teaching, making it difficult to adjust strategies in a timely manner

3. The necessity of AI-enabled English teaching in secondary schools

In today's digital era, the field of education is undergoing profound changes, and English teaching has also ushered in new opportunities and challenges. The integration of Artificial Intelligence (AI) technology has injected new vitality into English language teaching in secondary schools, bringing significant improvements in various aspects such as teaching efficiency, personalized learning, and intelligent assessment feedback (Sabic et al, 2024).

3.1. Digital transformation of English education

With the rapid progress of science and technology, the application of artificial intelligence (AI) in the field of education is becoming more and more widespread, especially in English teaching, and its advantages are gradually emerging. Currently, students' demand for digital learning methods is increasing, and AI-assisted English teaching caters to this trend of demand. AI can not only significantly improve teaching efficiency, but also provide customized learning solutions according to the individual needs of each student, thus effectively improving the overall quality and effectiveness of English teaching. In addition, AI technology provides rich and diverse learning materials and real cases for English teaching at secondary school level by integrating global high-quality educational resources, enabling students to start their learning journey at any time and any place, and greatly mobilizing their interest and initiative in learning.

3.2. Improving teaching efficiency and quality

AI technology plays an important role in teaching efficiency. In the past, teachers needed to spend a lot of time on repetitive tasks such as homework correction and grade statistics, but now these tasks can be done automatically by AI, which frees teachers from the heavy workload and allows them to devote more energy to personalized teaching. At the same time, AI systems can monitor students' progress and performance in real time, providing teachers with comprehensive and accurate feedback and suggestions. This enables teachers to adjust their teaching strategies according to students' specific conditions and guide students' learning more effectively, thus realizing the double improvement of teaching efficiency and quality (Fissore et al, 2025).

3.3. Help students personalized learning

Personalized learning is an important concept in modern education, and AI technology provides strong support for it. Each student has differences in English level, learning habits, needs, abilities and interests, etc., and the traditional unified teaching mode is difficult to meet the needs of all students. AI technology, through in-depth analysis of students' learning data, can customizes a personalized learning plan for each student, and provides matching learning resources and teaching programs. For example, the Intelligent Recommendation System can accurately recommend suitable courses and exercises according to the students' learning level; Intelligent Speech Recognition technology realizes voice interactive teaching with students, which enhances students' learning interest and participation. This personalized learning mode fully mobilizes students' learning enthusiasm and helps to improve the learning effect. Personalized learning aligns with Vygotsky's Zone of Proximal Development (ZPD) theory, which emphasizes scaffolding instruction to match learners' current abilities (Vygotsky, 1978). AI-enabled learning path planning engines operationalize ZPD by dynamically adjusting content difficulty based on

real-time performance data, enabling students to progress from guided practice to independent mastery.

3.4. Innovative Teaching Assessment and Feedback

Intelligent assessment and feedback is also a highlight of AI technology in English teaching (Shi, 2024). Under the innovative teaching mode, AI breaks the limitations of traditional English teaching and realizes personalized, interactive and intelligent teaching. Through intelligent voice recognition technology, interactive teaching such as human-machine dialogues and speaking practice becomes possible; personalized learning recommendation system provides students with customized learning paths and resources; and automated assessment system provides real-time feedback on students' learning progress and results, and provides teachers with accurate teaching guidance.The AI system is able to intelligently assess and provide feedback on students' assignments and performance. With the help of natural language processing and machine learning technology, the AI system can quickly and accurately assess students' ability to express themselves in writing and speaking, and give specific suggestions for improvement and directions for practice. This immediate feedback mechanism helps students identify and correct errors in a timely manner, further improving learning.

4. AI-enabled Secondary English Teaching Implementation Pathway

AI technology provides us with a brand new solution path to the above mentioned dilemmas in traditional English teaching, personalized learning, teaching research resources and teachers' professional development. In the following, we will illustrate the solutions from four dimensions of AI technology: Intelligent Context Creation System, Learning Path Planning Engine, Intelligent Literature Retrieval and Analysis System, and Teacher Skill Assessment and Feedback System.

4.1. Teaching Methodology - Intelligent Context Creation System

To address the problem of limited English teaching methods in traditional secondary school English teaching, we can combine the Intelligent Context Creation System in AI technology to make up for the limited problems in teaching methods. Intelligent Context Creation System refers to the use of AI's image recognition, speech synthesis and scene simulation technology to build realistic English communication situations. By creating virtual scenes, such as asking for directions on foreign streets and ordering food in restaurants, students are immersed in the application of English in real life (Sperling et al, 2024). For example, in the middle school speaking class, the teacher uses the Intelligent Context Creation System to create a foreign airport scene, and the projection sound equipment shows the busy scene and broadcasting voice. Students are immersed in the scene, asking for boarding gates and checking baggage in English, actively participating in the communication, improving their speaking skills and enhancing their understanding of the practical application of English. Constructivist learning theory posits that knowledge is built through interaction with authentic contexts (Bruner, 1966). The Intelligent Context Creation System leverages this principle by simulating real-world scenarios (e.g., airport

check-ins), allowing students to actively construct language skills through immersive practice rather than passive memorization.

4.2. Personalized Learning - Learning Path Planning Engine Based on Big Data Analysis

Traditional large classroom teaching can not take care of the learning needs of all students. We can use AI technology based on big data analysis of the Learning Path Planning Engine. It refers to the teaching that can use big data to analyze students' learning data, including learning progress, knowledge mastery, correct answer rate, etc., to tailor a personalized learning path for each student. By mining the learning characteristics and needs of students, targeted learning resources and practice topics are provided. For example, for students who are weak in grammar learning, the platform will recommend a series of grammar explaining videos and special exercises suitable for their level to help students gradually consolidate their grammar knowledge and improve their learning performance.

4.3. Teaching Research Resources-Intelligent Search and Analysis System for Educational Literature

For the collection and integration difficulties in teaching research resources, we can use the Intelligent Search and Analysis System for Educational Literature in AI technology. It refers to the intelligent retrieval and analysis of a large amount of educational literature with the help of natural language processing and machine learning algorithms. It can quickly screen the quality literature of secondary school English teaching and extract the summarized content to provide useful reference for educational researchers. For example, in order to explore the cutting-edge results of secondary school English reading teaching, English teachers, with the help of the literature intelligent retrieval and analysis system, input keywords to screen out thousands of related literature. The system carries out in-depth analysis and organization, refines the key information, and helps teachers to quickly grasp the information in a visual way, saving time and facilitating in-depth research (Lin et al, 2024).

4.4. Teachers' Professional Development-Teachers' Teaching Skills Intelligent Evaluation and Feedback System

To address the problem of the disconnect between teachers' teaching training and actual needs, we can make use of the Teacher Teaching Skills Intelligent Evaluation and Feedback System in AI technology. It refers to the use of video analysis and AI algorithms to monitor and analyze teachers' classroom teaching behavior in real time, identifying non-verbal factors such as teaching movements, expressions, language expressions and other non-verbal factors as well as verbal factors such as the organization of teaching content and the use of methods, and providing teachers with a comprehensive assessment and feedback of their teaching skills (Rajabi et al, 2024). For example, when teachers in the school participate in a teaching skills competition, the intelligent assessment system records and analyzes their classroom performance throughout the whole process. The system accurately captures details such as teachers' body language and eye contact, and analyzes the teaching content in depth. After the competition, the system generates a detailed report, which not only identifies teachers' strengths and weaknesses, but also makes

specific suggestions for improvement. Teachers' teaching effectiveness is significantly improved after targeted training based on the report. As shown in Table2.

Table2. AI empowers English teaching in secondary schools Forms

AI technology	Issues	core technology	application scenario	typical example
Intelligent Context Creation System	Limitations of traditional teaching methods and lack of authentic language contexts	Image recognition, speech synthesis, scene simulation technology	Constructing realistic English communication situations to enhance practical application skills	Middle school English class practices airport role-play, with students asking about boarding gates and luggage check-in in English.
Learning Path Planning Engine	Large classrooms struggle to meet students' individual learning needs	Big Data Analysis, Learning Data Mining	Customized personalized learning paths with targeted resources	For grammar-weak students, we suggest targeted videos and exercises to enhance understanding and performance.
Intelligent Search System for Educational Literature	Inefficient collection and integration of research literature on teaching and learning	Natural language processing, machine learning algorithms	Efficiently screen and analyze educational literature to assist in teaching research	After teachers enter keywords, the system distills key information from thousands of documents and presents the results in a visual way.
Teacher Skills Assessment Feedback System	Disconnect between teaching and training and actual needs, inefficient skills upgrading	Video analysis, Artificial Intelligence algorithms	Real-time assessment of teaching behaviors and precise recommendations for improvement	Record teachers' classroom performance, analyze body language, content organization, etc., generate reports and guide targeted training.

4.5. Case and Analysis

Beijing XX Key High School introduced an AI-based VR intelligent context simulation system, aiming to solve the problems of low oral participation and lack of real context in the traditional English classroom. The system has built-in several life scenarios, such as airport check-in and restaurant ordering, to improve students' English skills through dynamic dialog and voice interaction. One VR speaking class is arranged every week, students practice in groups, and teachers use the system's data analysis to design targeted exercises. The results are remarkable: after one semester, the average score of the students' speaking test increased by 23%, and their fluency improved by 35%. 85% of the students thought the VR class was more interesting, and

the participation rate increased from 40% to 78%. On the teacher's side, AI auto-correction saves 30% of time and precise intervention reduces the error rate. Schools utilize a global library of teaching resources to enrich the curriculum. However, issues such as high technology costs, time-consuming training, and data security still need to be addressed. The case demonstrates the practical value of the intelligent contextual simulation system, which can be used in the future to reduce costs through school-enterprise cooperation, establish a teacher-AI collaborative teaching model, and further balance technological empowerment and humanistic care.

5. Discussion and outlook

Traditional secondary school English teaching mostly adopts the mode of "teacher speaking, student memorizing", which is single and boring, difficult to stimulate students' enthusiasm, and the learning effect is not good. The content of the textbook is often out of touch with students' lives, which adds to the problem. Fortunately, the introduction of AI technology has brought innovative opportunities for secondary school English teaching. Intelligent systems can customize the content according to students' progress and personality, and integrate multimedia, games, virtual scenes and other diversified means to make learning interesting and interactive, and stimulate initiative and desire for exploration. In the future, AI will more deeply simulate human teachers' strategies, dynamically adjust the teaching plan to adapt to different students' styles and needs, realize customized teaching, and improve learning efficiency and quality.

In the traditional English classroom model in secondary schools, it is often difficult for teachers to take full account of the individual differences of each student, so that individualized learning needs are often not fully met. This makes it difficult for some students to get timely and effective help when they encounter learning problems, while others may become bored because of the fast pace of learning. However, the application of AI technology has brought a new light to this problem. By collecting and analyzing students' learning data, AI is able to carefully construct a personalized learning profile for each student. Based on these in-depth data insights, AI can accurately provide learning advice and tutoring based on students' specific needs. For example, when a student encounters an obstacle to understanding a certain knowledge point, AI will intelligently push relevant explanatory materials, practice questions or video tutorials to help the student overcome the difficulty. At the same time, AI can also flexibly adjust the difficulty of homework as well as the content of exams based on students' learning levels and abilities, ensuring that every student can continue to make progress at a level of challenge that matches his or her abilities. Looking to the future, with the continuous development and improvement of AI technology, personalized teaching will become more accurate and in-depth, truly promoting the overall development and individual growth of each student.

Traditional secondary school English teaching and research resources are limited, teachers' preparation and research time-consuming and laborious collection and collation of materials, and resources are slow to update, difficult to meet the development of the times and students' needs. AI technology can integrate global high-quality resources, and through the intelligent search and recommendation system to help teachers quickly access the required materials to improve the

efficiency of lesson preparation. At the same time, AI can also analyze and mine teaching data to provide teachers with research references and optimize teaching strategies. Looking to the future, AI is expected to build a globalized resource sharing platform, promote teachers' exchanges, and promote the development of secondary school English teaching research.

In traditional secondary school English teaching, teachers' professional development is limited. Lack of training opportunities and heavy teaching loads often leave teachers with no time to improve their teaching skills and literacy, which affects the quality of teaching.AI technology provides personalized support for teachers, with online courses and teaching communities that help them learn and communicate at any time; it also analyzes teaching problems and gives them advice. It prompts teachers to learn new methods and improve their digital literacy and innovation. In the future, AI will be an important partner in teachers' professional development, providing precise training and helping them grow into excellent educators.

While AI offers transformative potential, its integration into secondary English education faces practical challenges. First, data privacy concerns arise from the collection and analysis of students' learning data. Schools must ensure compliance with regulations (e.g., GDPR, COPPA) to protect sensitive information. Second, the digital divide may exacerbate educational inequities, as under-resourced schools lack infrastructure to adopt advanced AI tools. Third, teacher resistance to technology-driven pedagogy requires addressing through phased training programs and evidence-based demonstrations of AI's efficacy. Finally, over-reliance on AI risks diminishing human-centric aspects of teaching, such as emotional support and creative collaboration. A balanced approach that harmonizes AI capabilities with teacher expertise is essential.

6. Conclusion

Artificial Intelligence (AI) technology has brought new life to the field of secondary school English education, and its positive effects are evident to all, from innovating teaching methods to realizing personalized teaching, to optimizing the allocation of teaching resources and improving the professional level of teachers. With the continuous development and wide application of this technology, it is expected that AI will play an even more central role in the future, not only efficiently solving current problems, but also opening up new teaching and learning paths, laying a solid foundation for cultivating talents with an international outlook and competitiveness. Therefore, actively embracing and making full use of AI technology and continuously tapping its potential in the field of education are the key measures to promote the quality of secondary school English teaching and the modernization of education.

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References

Aihaiti, M. (2015). The meaning of applying task-driven teaching method in the information technology training of primary and secondary school teachers. The Science Education Article Collects.

Bruner, J. S. (1966). Toward a theory of instruction. studies in philosophy & education, 7(4), 280-290.

Cole, M., Johnsteiner, V., Scribner, S., & Souberman, E. (1978). Mind in society: the development of higher psychological processes. Psychological Processes, 7740(1), 774027.

Duraes, D., Bezerra, R., & Novais, P. (2024). AI-enabled Educational Transformation in Secondary Schools: Leveraging Data Insights for Inclusive Learning Environments. 2024 IEEE Global Engineering Education Conference (EDUCON). IEEE.

Fissore, C., Floris, F., Conte, M. M., & Sacchet, M. (2025). Teaching the Specialized Language of Mathematics with a Data-Driven Approach: What Data Do We Use?. International Conference on Bridging the Gap between AI and Reality. Springer, Cham.

Lin, L., Zhou, D., Wang, J., & Wang, Y. (2024). A systematic review of big data driven education evaluation:. SAGE Open, 14(2), 1-11.

Ng, D. T. K., Su, J., & Chu, S. K. W. (2024). Fostering secondary school students' ai literacy through making AI-enabled recycling bins. Education and Information Technologies, 29(8), 32.

Palmero, J. R.(2025). The role of artificial intelligence in project-based learning: teacher perceptions and pedagogical implications. Education Sciences, 15(2), 150.

Rajabi, P., Taghipour, P., Cukierman, D., & Doleck, T. (2024). Unleashing chatgpt's impact in higher education: student and faculty perspectives. Computers in Human Behavior: Artificial Humans, 2(2), 100090.

Sabic, I., Puljiz, H., & Smoljo, A. (2024). Personalized learning in the croatian national education system: a study of ai implementation in the e-class register. SN Computer Science, 5(8), 1-11.

Schulte, C., Biehler, R., & Sven Hüsing. (2022). Exploring the data-driven world: teaching ai and ml from a data-centric perspective.

Shi, H. (2024). English Situational ODIAR Teaching Framework Based on AI Painting and Implementation Pathways. 2024 International Conference on Informatics Education and Computer Technology Applications (IECA). IEEE.

Sperling, K., Stenliden, Linnéa, Nissen, J., & Heintz, F. (2024). Behind the scenes of co-designing ai and la in k-12 education. Postdigital Science and Education, 6(1), 321-341.