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Exploring the Paths of Artificial Intelligence Empowering Junior High School English Teaching

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Abstract: Against the background of advancing digital transformation in education and the gradual implementation of the new curriculum standards, artificial intelligence (AI) provides new technical support for junior high school English teaching to break through traditional bottlenecks and accelerate the cultivation of students' core competencies. At present, how to use AI to improve the quality of junior high school English teaching and create a suitable environment for the multi-dimensional development of students' core competencies has become an issue that frontline teachers need to explore in depth. Therefore, starting from the value of AI empowering junior high school English teaching, this paper discusses its practical paths, and summarizes the challenges and coping strategies in specific operations, aiming to support the high-quality development of junior high school English teaching.

Keywords: Artificial intelligence; Junior high school English; PEP edition textbooks; Teaching paths; Core competencies

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1. Introduction

With the extensive application of big data, natural language processing, speech recognition, adaptive learning and other AI technologies in education, teaching is transforming from standardization, experience-orientation and simplification to personalization, data-orientation and diversification. As a core subject in compulsory education, junior high school English must keep pace with this reform trend and take the initiative to deeply integrate with AI to achieve high-quality development. Focusing on AI empowerment in junior high school English teaching and making corresponding adjustments in teaching concepts, contents and methods will help implement curriculum standards, solve teaching pain points and stimulate students' internal learning motivation. In junior high school English teaching, teachers should apply AI personalized to different stages before, during and after class to build an all-round and multi-level teaching system.

2. Value of artificial intelligence empowering junior high school English teaching

2.1. Implementing curriculum standards and focusing on core competency cultivation

The new curriculum standards emphasize that English teaching should highlight the orientation of core competencies and promote students' growth in language ability, cultural awareness, thinking quality and learning ability. AI technology provides strong support for junior high school English teaching to meet this requirement [1]. On the one hand, it can quickly analyze massive data generated in students' learning process, accurately locate learning difficulties in language knowledge, skills and cultural understanding, and provide targeted teaching suggestions for teachers. On the other hand, it can simulate real language environments, provide rich language practice scenarios, bring students an immersive learning experience, and encourage them to practice language ability, deepen cultural understanding and improve thinking quality through active exploration.

2.2. Solving teaching pain points and improving teaching efficiency and quality

The PEP edition junior high school English textbooks contain complex knowledge points and heavy teaching tasks in vocabulary, grammar and discourse, and the traditional teaching mode can hardly meet practical needs [2]. By empowering English teaching with AI, teachers can effectively improve the shortcomings of traditional modes and solve pain points: for example, using big data analysis to quickly complete learning situation diagnosis, homework correction and error classification, so that teachers can devote more time and energy to teaching design, personalized guidance and education practice; using intelligent speech evaluation systems to correct students' pronunciation and intonation to solve the problem of "silent English"; using adaptive learning platforms to push personalized resources to realize differentiated teaching and enhance the pertinence and effectiveness of classroom teaching [3].

2.3. Innovating teaching modes and stimulating students' internal learning motivation

Junior high school students are young, curious and willing to accept new things. The immersive, interactive and game-based learning scenarios created by AI fit their cognitive characteristics. For instance, AI virtual partners and intelligent voice assistants interact with students in interesting ways, guide them to "speak English," and help relieve shyness and tension in oral practice; virtual language communities build cross-time and cross-space communication platforms for students to talk with virtual roles or collaborate with classmates remotely, thus expanding oral practice channels. By applying these AI tools in teaching, teachers can enrich the game elements in teaching modes and stimulate students' internal motivation to participate in teaching activities [4,5].

3. Practical paths of artificial intelligence empowering junior high school English teaching

3.1. Before class: Precise learning situation diagnosis to consolidate lesson preparation

3.1.1. Intelligent preview push to master prior knowledge

Teachers design tiered preview tasks based on unit themes of PEP textbooks, assign tasks through AI teaching platforms, analyze students' preview data and automatically generate preview reports to accurately grasp learning situations. Taking "Unit 2 We're Family! (Grade 7 Volume 1)" as an example, teachers can design tiered preview tasks as follows [6]:

(1) Basic level: vocabulary repetition, sentence pattern preview
(2) Improvement level: preliminary discourse comprehension, reflection on simple questions
(3) Expansion level: exploration of theme-related background knowledge

Then, teachers assign tasks via the AI platform; students finish preview work on the platform. The AI system automatically collects and analyzes data, including pronunciation accuracy, sentence pattern proficiency, discourse comprehension depth and background knowledge exploration, then generates a preview report. The report shows not only the overall class performance but also detailed records of each student, helping teachers precisely locate weak points and optimize teaching design [7]. With preview reports, teachers can clearly see which students struggle with vocabulary pronunciation, sentence patterns or discourse and background understanding, then integrate spelling contests, sentence transformation exercises and other activities into teaching to meet students' actual needs.

3.1.2. Intelligent integration of teaching resources to optimize lesson preparation efficiency

PEP textbooks emphasize thematic context and discourse teaching. During lesson preparation, teachers can use AI lesson preparation assistants to quickly integrate multi-modal resources matching the textbooks to support teaching design. For example, for "Unit 4 My Favourite Subject," teachers can use the AI assistant to collect pictures, videos and audio related to junior high school subjects; input instructions to let the system automatically decompose textbook knowledge points and generate teaching objectives, key and difficult points, and teaching procedures; combine multi-modal resources and preview reports to rearrange textbook content into personalized lesson plans that meet both textbook requirements and students' cognitive characteristics[8]. By using AI to integrate matching multi-modal resources, teachers are freed from tedious resource collection and knowledge sorting, and can devote more energy to innovating teaching methods and deepening content, significantly improving lesson preparation efficiency and quality.

3.1.3. Intelligent learning situation analysis to customize personalized teaching starting points

In addition to assigning preview tasks and integrating resources, AI can deeply analyze students' historical learning data (test scores, classroom participation, homework quality, etc.) to build student learning profiles that visually show knowledge mastery, learning habits, interests and potential. Based on learning profiles, teachers can precisely set teaching starting points: for students weak in reading comprehension, push micro-videos on reading skills in advance; for those unskilled in grammar, design targeted grammar exercises. Compared with traditional lesson preparation, this method customizes personalized starting points based on real data, provides more suitable support, improves teaching pertinence, overcomes the "one-size-fits-all" drawback and follows the principle of teaching students in accordance with their aptitude.

3.2. During class: Multi-modal empowerment to build an efficient smart classroom

3.2.1. Multi-modal situation creation to restore real language scenarios

According to the characteristics of PEP textbooks, teachers can use VR/AR, speech synthesis and animation generation technologies to create immersive language situations and integrate contexts into teaching to solve the "lack of context" in traditional teaching. Taking "Unit 2 No Rules, No Order (Grade 7 Volume 2)" as an example, teachers can use AR to simulate a restaurant scene where students play roles of waiters or customers and interact to complete food ordering [9,10]. In the virtual space, waiters ask about and respond to customers' needs accurately; customers express demands clearly and thank waiters politely. Such dialogue not only

deepens students' understanding of unit language knowledge but also enriches their comprehension, connects abstract language with cultural background, and cultivates their awareness of rules.

3.2.2. Intelligent listening and speaking training to break through oral teaching bottlenecks

Listening and speaking competence is a key focus and a major difficulty in junior high school English teaching. AI speech recognition and evaluation systems (such as iFlytek E-Talking) provide instant feedback and precise pronunciation correction, offering new solutions to students' "afraid to speak, speak poorly" problems. Through the iFlytek platform, teachers guide students to repeat dialogues and read texts; the system automatically analyzes pronunciation, intonation and fluency, generates reports, marks wrong words and demonstrates standard pronunciation. This one-to-one guidance replaces teachers' one-by-one correction, enabling every student to receive timely and accurate feedback, which greatly improves learning efficiency and motivation [11]. Furthermore, the platform records full learning data and designs personalized training plans based on performance. Teachers can use these plans to guide targeted practice: for example, when the platform recommends stress and liaison training, teachers can design classroom games like "Stress Challenge" and "Liaison Guess" to strengthen oral skills in a relaxing atmosphere.

3.2.3. Intelligent interactive Q&A to activate classroom vitality

The intelligent Q&A function of AI teaching platforms understands students' language input and quickly retrieves accurate answers. Teachers can use this function to optimize classroom interaction, boost engagement and vitalize the class. During teaching "Unit 7 When Tomorrow Comes," teachers can ask open-ended questions such as: "Besides the technological achievements mentioned in the text, what new technologies or products do you know? What are your visions for the future?" If students have doubts while thinking, they can ask the AI system for hints to deepen reflection. The system responds rapidly with rich information to inspire ideas and help improve answers. This interactive mode breaks the traditional teacher-led Q&A pattern and makes students active class participants.

3.3. After class: Intelligent evaluation and expansion to achieve personalized consolidation

3.3.1. Intelligent homework push to reduce burden and improve quality by differentiation

AI teaching platforms analyze students' classroom performance and textbook knowledge points to automatically generate and assign tiered homework, helping "reduce burden and improve quality". Based on performance, the platform divides students into three levels (A, B, C) and designs corresponding exercises considering textbook content. Taking "Unit 4 Eat Well" as an example, the platform will design vocabulary spelling, word definition and sentence translation practice assignments for students at level A; short essay writing tasks on a healthy diet for students at level B; and an extended assignment of "creating a restaurant menu" for students at level C [12]. After students submit homework, the platform automatically grades objective items, analyzes subjective responses, points out grammar and logic errors, provides vocabulary optimization suggestions and guides targeted strengthening.

3.3.2. Personalized tutoring push to precisely fill learning gaps

Based on homework analysis, the AI platform accurately identifies knowledge weaknesses and pushes personalized tutoring resources for targeted improvement: for students lacking vocabulary, recommend vocabulary games and root-affix videos; for those weak in grammar, push micro-lessons and tiered exercises;

for those poor at writing, provide model essays for appreciation [13]. After receiving resources, students can watch explanations or practice repeatedly at any time. The platform records learning progress, forms personalized files, reminds students of unmastered skills and guides further practice, realizing "learn what you lack".

3.3.3. Learning path planning to promote sustainable development

A key function of AI platforms is planning personalized learning paths based on progress and performance. Considering students' foundation, interests and goals, the platform generates customized paths including short-term and long-term objectives, learning strategies and recommended resources to clarify direction and ensure steady progress. For example, if the platform finds a student weak in listening, it suggests daily listening practice and recommends English broadcasts, movies and audiobooks. Teachers can guide students to follow the path and integrate English learning into daily entertainment to achieve continuous improvement.

4. Challenges and coping strategies of AI-empowered junior high school English teaching

4.1. Challenges

(1) Ethical and privacy risks: AI teaching involves personal and learning data, with risks of leakage and abuse; some tools have weak content censorship and may provide inappropriate information.

(2) Over-reliance on technology and neglect of humanity: Some teachers over-depend on AI and ignore emotional communication, cultural guidance and thinking cultivation in English teaching.

(3) Uneven resources and technical adaptation: Gaps exist in AI equipment and resources between urban and rural schools and among different institutions; some tools have low compatibility with textbooks and homogeneous functions, failing to meet practical needs.

(4) Insufficient digital literacy: Some teachers (especially senior teachers) and young students lack proficiency in operating AI tools.

4.2. Optimization strategies

(1) Stick to ethical bottom lines and standardize data management.

(2) Adhere to human-machine collaboration, highlight teachers' leading role and students' central position, and avoid "technology supremacy" [14].

(3) Tilt AI educational resources to rural and weak schools, balance resource allocation and improve technical compatibility with textbooks.

(4) Carry out textbook-specific AI training for teachers and standardized AI usage education for students [15].

5. Conclusion and prospect

In summary, using AI to realize the personalized, data-driven and diversified transformation of junior high school English teaching and create a supportive environment for core competency development is an inevitable choice to implement the new curriculum standards. This transformation requires teachers not only to update concepts and deeply integrate AI into pre-class, in-class and post-class teaching, but also to adopt targeted measures to solve practical problems, so as to improve teaching effectiveness and ensure AI truly

serves the cultivation of students' core competencies.

In the future, with the continuous maturity of AI, its application scenarios in junior high school English teaching will become more diverse. Teachers can promote teaching innovation from the following aspects:

(1) Use AI for precise learning situation diagnosis to understand students' foundations and interests and push personalized preview materials.

(2) Use multi-modal AI to create real language scenarios for immersive listening and speaking practice to break through oral bottlenecks.

(3) Use intelligent evaluation systems to conduct diversified assessments of homework and performance, build student growth profiles, and support subsequent teaching.

Disclosure statement

The author declares no conflict of interest.

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