Curriculum and Teaching Methodology (2026)
Clausius Scientific Press, Canada

DOI: 10.23977/curtm.2026.090121
ISSN 2616-2261 Vol. 9 Num. 1

An Exploration of AI-Assisted Precision Teaching Practices in English Language Education

Sirui Kou

School of English Language and Culture, Xi'an Fanyi University, Xi'an, China

Keywords: Artificial Intelligence; English Language Teaching; Precision Teaching; Personalized Learning; Human-Machine Collaboration

Abstract: This paper aims to explore the current application status, challenges and optimization paths of artificial intelligence technology in precision teaching field of English language learning, and through reviewing evolution of artificial intelligence-driven teaching models, this paper analyzes core issues in current practice, including alignment of technology and education, ethics of data and integration of human teaching agents. Subsequently, this paper proposes systematic strategies from dimensions of constructing human-machine collaborative ecosystem, innovating dynamic assessment system and deepening teacher professional development. Deep integration of artificial intelligence is reshaping paradigm of English language teaching, while key to its success lies in achieving harmonious unity between technological empowerment and authentic essence of education, thereby advancing toward new realm of personalized and efficient language acquisition.

1. Introduction

Rapid development of artificial intelligence technology is reshaping educational landscape with unprecedented depth and breadth, providing revolutionary tools for English language teaching, which realize paradigm shift from standardization to personalization. Concept of precision teaching emphasizes data-based assessment and targeted intervention, and its integration with AI technology has become a key approach to solve the inherent contradiction in traditional teaching, where this contradiction is a conflict between scalability and personalization. This article aims to systematically review current status of AI-assisted English precision teaching practice, analyze core challenges such as technology-education alignment, data ethics, and roles of teachers and students, thereby further exploring construction of sustainable, people-oriented human-machine collaboration teaching ecosystem. The goal is to promote English language teaching toward greater scientific rigor, efficiency and humanistic depth.

2. Analysis of the Current State of AI-Empowered Precision Teaching in English

2.1 Technological integration drives structural evolution of teaching models

Technology of artificial intelligence has already evolved from an auxiliary tool to a core engine driving transformation of English language teaching [1]. Natural language processing technology and

speech recognition technology enable machines to conduct real-time and detailed diagnosis of learners' language output, providing instant feedback from pronunciation, grammar to pragmatics, while adaptive learning systems dynamically plan learning paths and push customized exercises and resources through algorithm analysis of massive learning behavior data, thereby preliminarily realizing personalized learning experience of teaching students in accordance with their aptitude. At same time, intelligent writing assessment and virtual oral partners and other applications are gradually penetrating from higher education to basic education, which marks that English teaching is shifting from traditional, unified class teaching system to data-driven, learner-centered precise teaching paradigm, with this structural evolution not only improving teaching efficiency, but also fundamentally challenging traditional classroom structure where teachers serve as sole source of knowledge.

2.2 Data mining reshapes learning assessment dimensions and precision

In English language teaching, AI-powered data mining fundamentally reshapes assessment[2]. It moves beyond traditional test scores to continuously analyze micro-behaviors during learning: response time, hesitation patterns, error sequences, and resource navigation. By modeling this data, the system builds a dynamic, holistic learner profile, pinpointing specific gaps in grammar, vocabulary, or pronunciation, and even sensing engagement levels. This transforms assessment from a static, end-result measure (summative) into a continuous, diagnostic process (formative). Teachers gain real-time, evidence-based insights into each student's needs, enabling truly targeted interventions and giving "precision" in English teaching a concrete, data-driven foundation[3].

2.3 Intelligent environments expand spatial and temporal boundaries of language acquisition

Intervention of artificial intelligence significantly expands physical and situational boundaries of English language acquisition [4], where on one hand, intelligent mobile applications and online platforms make learning a ubiquitous activity that can be conducted anytime and anywhere, breaking spatial and temporal limitations of classroom, while on the other hand, Virtual Reality (VR) and Augmented Reality (AR) technologies begin to be used to create highly immersive virtual language environments, such as simulating international conferences, overseas shopping or cultural social scenarios. This enables learners to conduct meaning-driven language practice in low-risk, highly simulated situations[5]. Additionally, AI-based conversational agents (chatbots) provide interactive partners without limitations of time or repetition frequency, thereby effectively alleviating core anxiety of "lack of practice opportunities" in foreign language learning, with these intelligent environments collectively constructing a three-dimensional, multifaceted language input and output network, thus making language learning closer to complexity and richness of real world.

3. Core Issues in the Application of Artificial Intelligence to Precision English Language Teaching

3.1 The adaptability gap between technological rationality and educational complexity

Although prospects of technology look promising, a significant adaptability gap still exists between existing AI teaching tools and inherent complexity of real-world educational contexts, where many systems are designed based on idealized learning models, and algorithmic logic often prioritizes standardization and maximization of efficiency[6]. This makes them unable to adequately address non-linear, emotional, and socially constructive characteristics of teaching and learning, for example, AI-driven writing assessment tools may overly rely on grammatical rules while neglecting creativity of

content and rhetorical style, and automated oral assessment systems may accurately judge pronunciation but cannot understand subtle humor, irony, or cultural metaphors in conversations. This limitation of "technical rationality" may simplify teaching into quantifiable skill training, thereby potentially neglecting deeper goals that language carries as vehicle of humanistic communication, such as critical thinking, cultural empathy, and creative expression, which brings danger of forcibly cramming complex educational process into inappropriate, technically prescriptive mold[7].

3.2 Balancing dilemma of data utilization with privacy and ethics

In English teaching, precision-driven AI requires extensive data collection, including sensitive metrics like speech recordings, writing patterns, and interaction logs. This raises significant privacy and ethical concerns[8]. Currently, clear regulations for safely storing, ethically using, and attributing ownership of learner data in China's educational context are underdeveloped. Moreover, algorithms trained on historical data may perpetuate biases—such as favoring certain accents in pronunciation scoring—leading to unfair outcomes. The constant monitoring of student performance can also create a psychological "panopticon" effect, reducing learner autonomy. The core challenge lies in balancing the need for personalized, data-informed English instruction with robust protection of student privacy and ensuring equitable, transparent algorithmic practices.

3.3 The integration barrier between teacher roles and intelligent systems

Effective AI integration in English education is hindered by persistent barriers between teachers and technology[9]. Many teachers face uncertainty in redefining their role within AI-supported classrooms. Some perceive AI tools as threats to their authority, while others may over-rely on automated systems, reducing their instructional role to that of a monitor. Furthermore, most AI applications are poorly integrated into routine teaching workflows—such as lesson planning, in-class instruction, and assessment—and generate data reports that are difficult to interpret and act upon. Without adequate training in educational AI literacy, many educators lack the skills to critically select, adapt, and innovate with these tools. This results in a superficial overlap—rather than a meaningful fusion—of human and machine contributions, ultimately constraining the transformative potential of precision English teaching.

4. Optimization Strategies for Deepening AI-Assisted Precision English Language Teaching

4.1 Building a "human-centered" new ecosystem of human-machine collaborative teaching

To build a human-machine collaborative ecosystem in English teaching, teachers must move beyond viewing AI as a mere tool replacement. The system should be co-designed with educators, embedding pedagogical goals—like fostering communicative competence or critical thinking—directly into its architecture. Crucially, AI must offer explainable feedback; for instance, not just flagging grammar errors but clarifying why a sentence structure is inappropriate in a given context. In practice, AI can manage routine tasks such as vocabulary drills, pronunciation correction, and grading standardized quizzes, freeing the teacher to focus on what technology cannot replicate: facilitating nuanced debates, guiding reflective writing workshops, providing empathetic encouragement, and designing authentic tasks that require cultural and creative engagement. For example, if AI identifies a student struggling with article usage, the teacher might organize a peer-editing session focused on practical writing samples, using AI-generated data to personalize guidance while offering the human support essential for confidence and deeper understanding.

4.2 Innovating a dynamic assessment and intervention system based on multimodal data

To fully leverage value of data while avoiding ethical risks, it is necessary to innovate assessment system, which needs to shift from static diagnosis to dynamic, developmental "assessment-learning" integrated cycle. Core here lies in establishing a safe, compliant and transparent educational data governance framework, and at technical level, privacy-preserving computation and federated learning and other cutting-edge technologies should be adopted to realize data "available but not visible", thereby conducting model training and analysis without exposing original data. At institutional level, clear informed consent agreements should be formulated to transparently communicate to students and parents' scope, purpose and duration of data collection, while granting them rights to access, correct and delete their data, with schools establishing ethics review committees to conduct pre-implementation assessment and continuous supervision of ethical risks related to AI teaching projects.

Moreover, on this basis, evaluation system should transcend evaluation of discrete language skills (listening, speaking, reading, writing), turning toward multi-dimensional, process-oriented depiction of integrated language ability, metacognitive strategies and learning disposition. System needs to integrate learning behavior data (e.g., platform interactions), cognitive process data (e.g., eye-tracking, writing revision trajectories) and affective-physiological data (under compliant conditions, e.g., speech emotion analysis), through multimodal learning analytics, whereby a more comprehensive learner state model can be constructed. More importantly, system should possess "dynamic intervention" capability, which means when model detects that students encounter learning bottleneck, motivation decline or cognitive overload, it should not only alert teachers, but also automatically trigger preset adaptive support strategies, such as pushing a micro-video explanation, adjusting task difficulty, or suggesting a break.

4.3 Deepening teacher professional development and role reconfiguration for the intelligent era

In the intelligent era, teachers are the crucial link responsible for implementing the "last mile" of precision English teaching. Their professional development must be systematically restructured around the practical teaching scenarios of "AI + education". The specific practical pathways are as follows: Firstly, in terms of practical AI literacy in education, teachers need to master the identification of AI tools applicable to English teaching (such as intelligent speech evaluation, grammar correction engines, and personalized reading recommendation systems) and critically evaluate their alignment with specific teaching objectives (e.g., "improving coherence in academic writing" or "correcting the pronunciation of specific phonemes"). They must also understand the limitations of these tools' evaluation logic to avoid over-reliance. Secondly, regarding the instructional application of data literacy, teachers should be able to interpret data analysis reports on English learning generated by AI systems (e.g., "trends in oral fluency over time" or "cluster analysis of high-frequency errors in writing") and translate these insights into concrete teaching decisions. For example, based on data identifying a common weakness in "past tense consistency" across the class, they can design targeted peer review activities or mini-lectures. Thirdly, in developing instructional design capabilities for human-machine collaboration, teachers must deeply integrate AI tools into the design of teaching activities within blended learning environments. For instance, virtual conversational agents (chatbots) can be utilized before or after class to provide contextualized oral practice, freeing up classroom time for more in-depth collaborative tasks. These may include group debates based on AI-generated texts from diverse cultural perspectives or critical analysis and revision of AI-generated writing feedback. Finally, in exercising digital ethics leadership in the classroom, teachers need to guide students in using technology responsibly. This includes facilitating discussions on academic integrity, technological dependency, and original thinking when employing online translation tools or AI writing assistance. When using speech analysis tools, they should

engage students in conversations about data privacy and the fairness of algorithms toward different accents, thereby cultivating students' awareness as digital citizens. In summary, teachers' professional development should transcend mere technical tool operation and focus on how to creatively, critically, and ethically leverage AI in the English classroom. The goal is to transform AI into an empowering partner that deepens language learning, fosters critical thinking, and enhances cultural awareness, rather than treating it as a mere automated substitute.

5. Conclusion

Artificial intelligence presents opportunity for precise paradigm shift in English language teaching. Through integration of technology, data-driven methods and expansion of environment, it significantly enhances feasibility and efficiency of personalized learning, yet this research reveals that current practice still falls into multiple dilemmas, including alignment of technology-education, ethics of data and integration of human-machine. If not properly resolved, empowerment provided by technology may possibly become new form of constraint. Path of future development must firmly follow principle of education as foundation and technology as application, which through systematically constructing ecosystem of human-machine collaboration, innovating system of dynamic assessment and deepening development of teacher professionalism, enables artificial intelligence to shift from replacing simple labor toward enhancing complex teaching wisdom.

References

[1] Zhang, C. Y. (2026). A new model of college English speaking teaching empowered by artificial intelligence. Modern English, (01), 1-3.

[2] Huang, W., & Lin, S. F. (2025-12-31). Exploration of the teaching path for junior high school English composition assisted by large language models. Hebei Economic Daily, 011.

[3] Ma, X. L. (2025). Innovation research on the teaching reform of mechanical industry English in higher vocational colleges under the background of artificial intelligence. English Square, (36), 95-98.

[4] Chen, X. (2025-12-16). Digital transformation of college English teaching supported by artificial intelligence. Heilongjiang Daily, 008.

[5] Mai, Y. H. (2025). Innovation and practice of "language service + technical communication" dual-oriented computer English teaching based on value education in the era of artificial intelligence. Modern English, (23), 75-78.

[6] Chen, L. (2025-11-26). Research on the innovation of English teaching methods empowered by artificial intelligence. Qinghai Daily, 007.

[7] Ji, Z. J., & Pan, M. W. (2025). Embracing artificial intelligence in language testing and assessment: Basic issues and ethical considerations—A summary of the "26th Asian Association for Language Testing Academic Forum". Foreign Language Testing and Teaching, (04), 61-62. https://doi.org/10.26970/j.cnki.fltt.1004-5112.2025.04.008

[8] Dang, X. (2025). Exploration of the application of artificial intelligence in innovative English teaching in colleges and universities. Innovation and Entrepreneurship Theory Research and Practice, 8(19), 37-39.

[9] Gu, A. F. (2025). Practical exploration of generative artificial intelligence empowering primary school English reading teaching. Educational Horizon, (38), 4-8.