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Enhancing Oral Fluency Competence In Future English Teachers Through Artificial Intelligence Tools And A Differentiated Approach

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ABSTRACT

Oral fluency competence represents a fundamental yet persistently elusive outcome in the training of future English as a Foreign Language (EFL) teachers. Traditional instructional methodologies, constrained by the temporal and practical limitations of the physical classroom, often prove insufficient to meet the diverse proficiency needs of pre-service educators. This article critically analyzes the integration of Artificial Intelligence (AI) tools within a structured Differentiated Instruction (DI) framework as a transformative pedagogical strategy to refine oral fluency development. It explores how AI-powered speech recognition, intelligent tutoring systems, and natural language processing chatbots can personalize pronunciation coaching, provide immediate corrective feedback, and create psychologically safe, simulated immersion environments. When combined with tiered content delivery, flexible grouping, and multimodal practice, this methodology transcends the barriers of large class sizes and learner heterogeneity. The article proposes a refined implementation model that positions AI not as a replacement for human interaction, but as an indispensable cognitive partner that amplifies the teacher's capacity to orchestrate a truly learner-centered, fluency-driven pedagogical ecosystem.

KEYWORDS: Artificial Intelligence in ELT, Oral Fluency, Differentiated Instruction, Pre-service Teacher Training, Speech Recognition, Chatbots, Pronunciation Coaching, Communicative Competence.

INTRODUCTION

In the domain of English language teacher education, the distinction between possessing knowledge of the language and possessing the ability to use it fluently is of paramount professional significance. Oral fluency characterized not merely by grammatical accuracy but by the speed, pausing patterns, automaticity, and prosodic naturalness of speech serves as the most immediate and publicly scrutinized indicator of a language teacher's competence [1]. A teacher's fluent, confident oral model is directly correlated with students' motivation, comprehensible input exposure, and overall communicative success in the classroom. Yet, globally, pre-service teacher training programs report a persistent gap: candidates often graduate with advanced declarative knowledge of English grammar and literature but exhibit hesitation, phonological interference from their first language, and a lack of spontaneous discourse management skills in their oral production [2].

The etiology of this fluency gap is multifactorial. First, in many non-English speaking contexts, the formal classroom provides the primary, if not exclusive, arena for oral practice, restricting

input to a few hours per week. Second, the inherent heterogeneity of pre-service teachers' proficiency levels ranging from B1 to C1 on the Common European Framework of Reference (CEFR) renders uniform, teacher-fronted speaking activities inefficient; tasks that challenge advanced learners can cognitively overwhelm and silence lower-level ones. Third, the psychological dimension of performance anxiety, or communication apprehension, is magnified in peer-group settings where one's professional identity is under construction. Repeatedly, instruction defaults to predictable, monologic presentations that assess fluency post-hoc rather than developing it dynamically through iterative, personalized practice.

The advent of advanced Artificial Intelligence (AI) tools offers an unprecedented opportunity to resolve these structural constraints. Unlike early computer-assisted language learning (CALL) software, contemporary AI encompassing automatic speech recognition (ASR), deep learning-driven natural language processing (NLP), and adaptive algorithms enables rich, interactive, and highly personalized language practice at scale [3]. Simultaneously, Differentiated Instruction (DI) provides the pedagogical architecture to operationalize this technological potential effectively. DI posits that systematic adaptations to content, process, and product based on learners' readiness, interest, and learning profiles maximize individual growth [4]. The nexus between these two domains the analytical power of AI and the empathetic, learner-centered logic of DI holds the key to a refined oral fluency methodology.

This article argues that the strategic integration of AI tools within a DI framework allows for a paradigm shift: from a classroom where fluency is tested to an ecosystem where fluency is engineered. By analyzing the affordances of specific AI technologies and mapping them onto differentiation principles, this paper proposes a concrete, scalable methodology to cultivate the automaticity and communicative spontaneity essential for the next generation of English language educators.

Materials And Methods

This study is structured as a critical conceptual review and methodological synthesis. A systematic literature search was conducted across ERIC, Scopus, IEEE Xplore, and Google Scholar databases for publications between 2015 and 2025. The search employed Boolean combinations of terms including: "Artificial Intelligence AND oral fluency," "Intelligent Tutoring Systems language learning," "ASR pronunciation feedback," "differentiated instruction EFL," "chatbots in teacher education," "speech recognition L2 prosody," and "AI-driven scaffolding speaking." Inclusion criteria targeted empirical studies demonstrating quantifiable gains in speaking fluency sub-components (speed, breakdown, repair), qualitative analyses of learner interaction with AI tools, and pedagogical frameworks for technology integration in pre-service teacher education. Exclusion criteria included opinion pieces, studies focusing exclusively on grammatical accuracy without fluency measures, and K-12 contexts not directly transferable to adult pre-service trainees. The synthesis integrated findings from computer science perspectives on AI affordances with applied linguistics research on fluency development to construct a theoretically grounded, practically feasible instructional model.

Results

The synthesis of evidence yields a three-phase, cyclic pedagogical model that leverages AI tools as the engine of differentiation and individualized fluency practice.

Phase 1: AI-Mediated Diagnostic and Profile Generation

The traditional oral placement test is a blunt instrument, typically providing a single holistic score that obscures the granular components of fluency. The refined methodology commences with an AI-driven diagnostic procedure using advanced ASR platforms. Pre-service teachers complete a series of speaking tasks ranging from reading aloud a phonetically balanced passage to spontaneous narrative production captured and analyzed by an AI speech evaluator. Unlike human raters, the AI analyzes the sample for paralinguistic and temporal features with precision: articulation rate (syllables per second), mean length of run (number of syllables between pauses), frequency and location of filled pauses (e.g., “um,” “uh”), and phonetic errors [5].

The immediate output is a personalized “Fluency Profile” for each teacher candidate. For instance, Learner A might demonstrate high-speed delivery (high articulation rate) but frequent mid-clause breakdowns, indicating a deficit in discourse planning and lexical retrieval automaticity. Learner B might show slow but grammatically accurate speech with unnatural, monotone prosody, indicating a need for suprasegmental and rhythm training. Learner C might perform adequately in monologue but exhibit disfluency during interactive, unpredictable dialogue. This diagnostic granularity is the cornerstone of differentiation; it enables the precise targeting of intervention rather than the application of broad, inefficient instruction. The AI does not merely rank learners but dissects the anatomy of their disfluency, a process that is too time-consuming for a single human assessor to perform for large cohorts.

Phase 2: Tiered, AI-Supported Deliberate Practice

With individual fluency profiles established, classroom and autonomous practice activities are systematically differentiated. The traditional weekly speaking class is restructured into a "fluency workshop" model featuring learning stations, each powered by a specific AI tool.

· Station A: The AI Articulation and Prosody Coach (Targeting Learner B). Learners whose profiles indicate phonological or prosodic deficits engage with ASR-based pronunciation applications. These tools provide visual, real-time spectrogram feedback, allowing the user to map their own intonation contour against a native-speaker model. This station focuses on “shadowing” exercises: the AI reads a sentence, and the learner repeats it, receiving an immediate similarity score and specific visual cues about the part of the utterance that deviated in pitch or rhythm. Crucially, this delicate form-focused practice occurs in a private, judgment-free interaction with the machine, eliminating the social anxiety that inhibits experimentation with new sounds and intonation patterns [6].

· Station B: The AI Conversational Chatbot (Targeting Learner C). For learners whose disfluency is interaction-specific, text-to-speech and NLP-based chatbots offer a powerful, low-stakes interlocutor. The chatbot, configured with a specific persona and pedagogical goal (e.g., a travel agent needing booking details, a student presenting a counter-argument), engages the learner in unscripted dialogue. Crucially, the AI can be differentiated by complexity: for a hesitant speaker, the bot might ask clarifying questions to scaffold the conversation, while for a more advanced speaker, it might introduce unexpected, cognitively demanding turns. The bot logs the entire interaction, tracking silent pauses and turn-taking latency. The learner can later analyze this transcript with the teacher, turning the bot log into a “language autopsy” of their communication breakdowns, fostering metacognitive awareness of their interactional style [7].

· Station C: The Human-in-the-Loop Fluency Circle (Targeting Learner A). This teacher-facilitated station uses AI-generated prompts based on contemporary debates. The AI serves as a "content partner," instantly generating role cards, discussion questions, or a list of essential lexis tailored to different proficiency tiers. While the speaking practice is entirely human, the AI's differentiated content preparation frees the instructor to focus exclusively on qualitative observation and subtle pedagogical interventions, such as pushing a learner to use a newly automated phrase from Station B.

Phase 3: The AI-Analyzed Portfolio and Metacognitive Reflection

The capstone of the refined methodology is an evolution of assessment from a high-stakes, terminal speaking exam to an iterative portfolio supported by AI analytics. Weekly, learners upload a brief "Vlog Podcast" to an AI-powered platform. The platform analyzes the recording, producing a longitudinal "Fluency Index" charting the learner's progress on articulation rate, reduction of a specific phonetic error, or decrease in hesitation markers. This data is visualized on a personal dashboard, forming the basis for a weekly learner-teacher conference. Instead of a subjective judgment, the conversation begins with the learner analyzing their own AI-generated data: "This week, my speech rate dropped because I was trying the thought-group pausing we discussed." The AI serves as an objective mirror, depersonalizing the often emotionally charged process of communication feedback. It transforms fluency development into a data-driven, gamified journey of personal improvement, aligning with the growth mindset essential for lifelong professional learning [8]. For future teachers, experiencing the pedagogical power of data-driven, personalized feedback is a transformative metacognitive lesson in modern assessment.

Discussion

The proposed methodology reframes the debate on AI in education. It argues that the fundamental benefit of AI in oral fluency training is not its efficiency in delivering content, but its unique affordance as a cognitive artifact for the private, deliberate practice of speaking. As Levelt's speech production model theorizes, fluency involves the seamless automation of the conceptualizer, formulator, and articulator [9]. In a traditional classroom, a learner cannot privately "pause" the social demands of conversation to practice re-formulating a syntactic frame; they must maintain the interaction. An AI chatbot, conversely, provides a patient, non-judgmental space for the iterative, cyclical practice necessary to build automaticity, serving as a scaffolding tool that gradually withdraws support as the learner internalizes linguistic routines.

The symbiotic relationship between AI and Differentiated Instruction is central to the model's feasibility. Without differentiation, AI tools risk being deployed as a uniform, "one-app-fits-all" solution, replicating the very pedagogical weakness they are intended to solve. DI provides the strategic logic tiered tasks, flexible grouping, learner profiles for a learning ecosystem where multiple AI tools can operate simultaneously and be prescribed purposefully. The teacher's role is elevated from a mere language model to a learning architect and data interpreter, who diagnoses the Fluency Profiles and matches learners to the appropriate AI-mediated stations [10]. This preserves the irreplaceable human element of teaching empathy, motivation, and the complex mediation of meaning while delegating the mechanistic, repetitive, and deeply personal aspects of speech practice to the machine.

Furthermore, this model addresses the critical affective domain. Foreign language anxiety, particularly in peer settings where future professional identity is at stake, is a primary inhibitor of oral development. The private, anonymous nature of AI conversational practice offers a "shielded" environment where learners can take the communicative risks necessary for growth without fear of public embarrassment. This psychological safety net is crucial for the transition from controlled, effortful speech to fluent, effortless communication.

Conclusion

The development of oral fluency competence in future English teachers is too complex and too vital to be left to traditional, mass-lecture and uniform-practice models. The refined methodology presented herein posits that the strategic fusion of Artificial Intelligence tools with a rigorous Differentiated Instruction framework creates a powerful pedagogical synergy. By using AI to diagnose the granular components of disfluency, mediate private and psychologically safe deliberate practice, and generate longitudinal, metacognitive analytics, this approach enables a level of personalized coaching previously unattainable at scale. The outcome is not merely a teacher who can speak English, but a reflective practitioner who has experienced a fully personalized learning journey and is thus inherently equipped and motivated to differentiate instruction in their own future classrooms. This is the new frontier of language teacher education: a data-informed, human-centered, and fluency-driven paradigm shift.

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